



# **STIC Search Report**

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**STIC Database Tracking Number: 152370**

**TO: Lansana Nyalley**  
**Location: rem/5b21/5c18**  
**Art Unit: 1621**  
**May 9, 2005**

**Case Serial Number: 10/626997**

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### **Search Notes**

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FILE 'HCAPLUS' ENTERED AT 15:33:48 ON 09 MAY 2005

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FILE COVERS 1907 - 9 May 2005 VOL 142 ISS 20

FILE LAST UPDATED: 8 May 2005 (20050508/ED)

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This file contains CAS Registry Numbers for easy and accurate substance identification.

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L1      21 SEA FILE=REGISTRY ABB=ON  PLU=ON  C3H2F4/MF
L2      3 SEA FILE=REGISTRY ABB=ON  PLU=ON  L1 AND 1(W)3(W)3(W)3(W)TETRAF
        LUORO?
L3      15 SEA FILE=REGISTRY ABB=ON  PLU=ON  C3H2CLF3/MF
L4      3 SEA FILE=REGISTRY ABB=ON  PLU=ON  L3 AND 3(W)3(W)3(W)TRIFLUORO?
        AND 1(W)CHLORO?
L5      15 SEA FILE=REGISTRY ABB=ON  PLU=ON  C3HCLF4/MF
L6      3 SEA FILE=REGISTRY ABB=ON  PLU=ON  L5 AND 1(W)3(W)3(W)3(W)TETRAF
        LUORO? AND 1(W)CHLORO?
L7      7 SEA FILE=REGISTRY ABB=ON  PLU=ON  C3H3F5/MF
L8      1 SEA FILE=REGISTRY ABB=ON  PLU=ON  L7 AND 1(W)1(W)1(W)3(W)3(W)PE
        NTAFLUORO?
L9      108 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L2 OR (1(W)3(W)3(W)3(W)TETRAFL
        UORO? AND PROPEN?)
L10     SEL  PLU=ON  L2 1- CHEM :          9 TERMS
L11     64 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L10
L12     113 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L11 OR L9
L13     SEL  PLU=ON  L4 1- CHEM :          7 TERMS
L14     69 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L13
L15     140 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L14 OR (1(W)CHLORO?)(L)(3(W)3(
        W)3(W)TRIFLUORO?)
L16     SEL  PLU=ON  L6 1- CHEM :          4 TERMS
L17     12 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L16
L18     29 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L17 OR (1(W)CHLORO?)(L)(3(W)3(
        W)3(W)TETRAFLUORO?)
L19     SEL  PLU=ON  L8 1- CHEM :          9 TERMS
L20     652 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L19
L21     831 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L20 OR (1(W)1(W)1(W)3(W)3(W)PE
        NTAFLUORO?)
L22     46 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L12 AND (L15 OR L18 OR L21)
L23     39 SEA FILE=REGISTRY ABB=ON  PLU=ON  HYDROGEN FLUORIDE?/CN

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L24 SEL PLU=ON L23 1- CHEM : 173 TERMS  
 L25 46497 SEA FILE=HCAPLUS ABB=ON PLU=ON L24  
 L26 46497 SEA FILE=HCAPLUS ABB=ON PLU=ON L25 OR HYDROGEN(W) FLUORID?  
 L27 21 SEA FILE=HCAPLUS ABB=ON PLU=ON L22 AND L26

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L27 ANSWER 1 OF 21 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2005:78307 HCAPLUS

DOCUMENT NUMBER: 142:158394

TITLE: Two-step process for the manufacture of 1,  
 3,3,3-  
**tetrafluoropropene** from 1-  
**chloro-3,3,3-**  
**trifluoropropene**

INVENTOR(S): Tung, Hsueh Sung; Johnson, Robert C.; Merkel, Daniel C.

PATENT ASSIGNEE(S): Honeywell International Inc., USA

SOURCE: U.S. Pat. Appl. Publ., 6 pp.

CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2005020862	A1	20050127	US 2003-626997	20030725
WO 2005012212	A2	20050210	WO 2004-US23160	20040721
WO 2005012212	A3	20050331		

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW

RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

PRIORITY APPLN. INFO.:

US 2003-626997

A 20030725

AB 1,3,3,3-Tetrafluoropropene

is prepared by: (A) reacting 1-chloro-3,

3,3-trifluoropropene with hydrogen

fluoride in the vapor phase and in the presence of a fluorination

catalyst and under conditions sufficient to form an intermediate product

comprising 1-chloro-1,3,3,

3-tetrafluoropropane and/or 1,1,

1,3,3-pentafluoropropane; and (B)

reacting the intermediate product with a caustic solution (e.g., aqueous NaOH)

and under conditions sufficient to dehydrochlorinate 1-

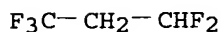
chloro-1,3,3,3-

tetrafluoropropane and/or to dehydrofluorinate 1,

1,1,3,3-pentafluoropropane

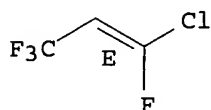
, forming 1,3,3,3-

IT **tetrafluoropropene.**  
 460-73-1P, 1,1,1,3,  
 3-Pentafluoropropane 730993-49-4P  
 730993-51-8P  
 RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT  
 (Reactant or reagent)  
 (in a two-step process for the manufacture of 1,3,  
 3,3-tetrafluoropropene from 1-  
 chloro-3,3,3-  
 trifluoropropene)  
 RN 460-73-1 HCAPLUS  
 CN Propane, 1,1,1,3,3-pentafluoro- (6CI, 8CI, 9CI) (CA INDEX NAME)



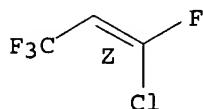
RN 730993-49-4 HCAPLUS  
 CN 1-Propene, 1-chloro-1,3,3,3-tetrafluoro-, (1E)- (9CI) (CA INDEX NAME)

Double bond geometry as shown.



RN 730993-51-8 HCAPLUS  
 CN 1-Propene, 1-chloro-1,3,3,3-tetrafluoro-, (1Z)- (9CI) (CA INDEX NAME)

Double bond geometry as shown.

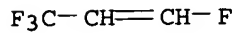


IT 7664-39-3, Hydrogen fluoride, reactions  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (in a two-step process for the manufacture of 1,3,  
 3,3-tetrafluoropropene from 1-  
 chloro-3,3,3-  
 trifluoropropene)  
 RN 7664-39-3 HCAPLUS  
 CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

IT 1645-83-6P, 1,3,3,3-  
 Tetrafluoropropene  
 RL: IMF (Industrial manufacture); PREP (Preparation)  
 (two-step process for the manufacture of 1,3,3,  
 3-tetrafluoropropene from 1-  
 chloro-3,3,3-  
 trifluoropropene)  
 RN 1645-83-6 HCAPLUS

CN 1-Propene, 1,3,3,3-tetrafluoro- (9CI) (CA INDEX NAME)

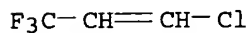


IT 2730-43-0, 1-Chloro-3,3,  
3-trifluoropropene

RL: RCT (Reactant); RACT (Reactant or reagent)  
(two-step process for the manufacture of 1,3,3,  
3-tetrafluoropropene from 1-  
chloro-3,3,3-  
trifluoropropene)

RN 2730-43-0 HCAPLUS

CN 1-Propene, 1-chloro-3,3,3-trifluoro- (9CI) (CA INDEX NAME)



L27 ANSWER 2 OF 21 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2004:117817 HCAPLUS

DOCUMENT NUMBER: 140:183586

TITLE: Process for manufacturing 1,3,  
3,3-tetrafluoropropene

INVENTOR(S): Yoshikawa, Satoru; Tamai, Ryoichi; Hibino, Yasuo

PATENT ASSIGNEE(S): Central Glass Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004043410	A2	20040212	JP 2002-206314	20020715
PRIORITY APPLN. INFO.:			JP 2002-206314	20020715

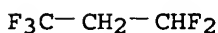
AB In the title process comprising reacting 1-chloro-  
3,3,3-trifluoropropene with  
hydrogen fluoride in the vapor phase in the presence of  
a fluorination catalyst for manufacturing 1,3,3,  
3-tetrafluoropropene (I), said catalyst comprises  
titanium and/or chromium. I is an intermediate for pharmaceuticals,  
agrochems., etc. The title process can be used for continuously and  
industrially manufacturing I.

IT 460-73-1P

RL: BYP (Byproduct); PREP (Preparation)  
(process for manufacturing 1,3,3,3-  
tetrafluoropropene by fluorination of 1-  
chloro-3,3,3-  
trifluoropropene)

RN 460-73-1 HCAPLUS

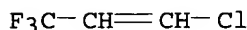
CN Propane, 1,1,1,3,3-pentafluoro- (6CI, 8CI, 9CI) (CA INDEX NAME)



IT 1645-83-6P, 1,3,3,3-  
**Tetrafluoropropene**  
 RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP  
 (Preparation)  
 (process for manufacturing 1,3,3,3-  
**tetrafluoropropene** by fluorination of 1-  
**chloro-3,3,3-**  
**trifluoropropene**)  
 RN 1645-83-6 HCAPLUS  
 CN 1-Propene, 1,3,3,3-tetrafluoro- (9CI) (CA INDEX NAME)



IT 2730-43-0, 1-Chloro-3,3,  
**3-trifluoropropene**  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (process for manufacturing 1,3,3,3-  
**tetrafluoropropene** by fluorination of 1-  
**chloro-3,3,3-**  
**trifluoropropene**)  
 RN 2730-43-0 HCAPLUS  
 CN 1-Propene, 1-chloro-3,3,3-trifluoro- (9CI) (CA INDEX NAME)



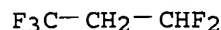
IT 7664-39-3, **Hydrogen fluoride**, reactions  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (titanium or chromium in process for manufacturing 1,3,  
**3,3-tetrafluoropropene** by fluorination of  
**1-chloro-3,3,3-**  
**trifluoropropene**)  
 RN 7664-39-3 HCAPLUS  
 CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

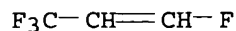
L27 ANSWER 3 OF 21 HCAPLUS COPYRIGHT 2005 ACS on STN  
 ACCESSION NUMBER: 2002:260176 HCAPLUS  
 DOCUMENT NUMBER: 136:300251  
 TITLE: Method of reactivating catalyst  
 INVENTOR(S): Kaneda, Shozo; Ishihara, Akira; Sakyu, Fuyuhiko;  
 Hibino, Yasuo  
 PATENT ASSIGNEE(S): Central Glass Co., Ltd., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2002102708	A2	20020409	JP 2000-298231	20000929

PRIORITY APPLN. INFO.: JP 2000-298231 20000929  
 AB The invention relates to a reactivation of an SbCl<sub>5</sub> catalyst supported on an activated charcoal. The catalyst is used for fluorination reactions carried out at low temps. The process comprises contacting the deactivated SbCl<sub>5</sub> catalyst with Cl<sub>2</sub> gas at ≥150°. After contacting with Cl<sub>2</sub> gas, the deactivated catalyst may contact HF gas. The catalyst is used for the reaction of 1-chloro-3,3,3-trifluoropropane and 1,3,3,3-tetrafluoropropene to form 1,1,1,3,3-pentafluoropropane.  
 IT 460-73-1P, 1,1,1,3,3-Pentafluoropropane.  
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
 (reactivation antimony pentachloride fluoronation catalyst)  
 RN 460-73-1 HCAPLUS  
 CN Propane, 1,1,1,3,3-pentafluoro- (6CI, 8CI, 9CI) (CA INDEX NAME)



IT 1645-83-6, 1,3,3,3-Tetrafluoropropene  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (reactivation antimony pentachloride fluoronation catalyst)  
 RN 1645-83-6 HCAPLUS  
 CN 1-Propene, 1,3,3,3-tetrafluoro- (9CI) (CA INDEX NAME)



IT 7664-39-3, Hydrogen fluoride, uses  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (reactivation antimony pentachloride fluoronation catalyst)  
 RN 7664-39-3 HCAPLUS  
 CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

L27 ANSWER 4 OF 21 HCAPLUS COPYRIGHT 2005 ACS on STN  
 ACCESSION NUMBER: 2001:416870 HCAPLUS  
 DOCUMENT NUMBER: 135:21209  
 TITLE: Process for the production of halogenofluorocarbons with relatively low corrosion of metal reactor  
 INVENTOR(S): Takubo, Seiji; Shibata, Noriaki; Nakada, Tatsuo; Shibamura, Takashi  
 PATENT ASSIGNEE(S): Daikin Industries, Ltd., Japan  
 SOURCE: PCT Int. Appl., 33 pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001040151	A1	20010607	WO 2000-JP8141	20001120
W: JP, US				
RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR				
EP 1234810	A1	20020828	EP 2000-976339	20001120
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI, CY, TR				
US 6521802	B1	20030218	US 2002-148415	20020529
PRIORITY APPLN. INFO.:			JP 1999-337759	A 19991129
			WO 2000-JP8141	W 20001120

OTHER SOURCE(S): MARPAT 135:21209

AB The process is carried out by fluorinating a halogenated hydrocarbon in a reaction system containing an antimony halide of  $\text{SbCl}_p\text{F}_{5-p}$  ( $p = 0-2$ ) (e.g.,  $\text{SbF}_5$ ), HF, and the halogenated hydrocarbon (e.g.,  $\text{CCl}_3\text{CH}_2\text{CHCl}_2$ ) serving as the starting material with the molar ratio of the antimony halide to HF being set in the range of 40/60 to 90/10. The halogenofluorocarbons (HFC) important as the substitute for CFC or HCFC can be highly selectively and economically produced with decreased corrosion of the reactor.

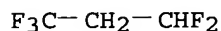
IT 460-73-1P 1645-83-6P

RL: IMF (Industrial manufacture); PREP (Preparation)

(process for the production of halogenofluorocarbons with relatively low corrosion of metal reactor)

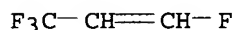
RN 460-73-1 HCAPLUS

CN Propane, 1,1,1,3,3-pentafluoro- (6CI, 8CI, 9CI) (CA INDEX NAME)



RN 1645-83-6 HCAPLUS

CN 1-Propene, 1,3,3,3-tetrafluoro- (9CI) (CA INDEX NAME)



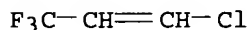
IT 2730-43-0 7664-39-3, Hydrogen fluoride, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(process for the production of halogenofluorocarbons with relatively low corrosion of metal reactor)

RN 2730-43-0 HCAPLUS

CN 1-Propene, 1-chloro-3,3,3-trifluoro- (9CI) (CA INDEX NAME)



RN 7664-39-3 HCAPLUS

CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

REFERENCE COUNT:

3

THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT



L27 ANSWER 5 OF 21 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2001:224485 HCAPLUS

DOCUMENT NUMBER: 134:222426

TITLE: Process for preparation of 1,1,  
1,3,3-**pentafluoropropane**

INVENTOR(S): Yu, Xiaohua; Du, Guohao; Sun, Gengsheng

PATENT ASSIGNEE(S): Zhejiang Provincial Chemical Engineering Research  
Inst., Peop. Rep. China

SOURCE: Faming Zhuanli Shenqing Gongkai Shuomingshu, 9 pp.

CODEN: CNXXEV

DOCUMENT TYPE: Patent

LANGUAGE: Chinese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 1266045	A	20000913	CN 2000-101468	20000121
CN 1120826	B	20030910		

PRIORITY APPLN. INFO.: CN 2000-101468 20000121

OTHER SOURCE(S): CASREACT 134:222426

AB The process comprises fluorinating 1,1,1,3,3- pentachloropropane with HF in the presence of 0.02-0.06% catalyst I and catalyst adjuvant at 30-150°, separating in HCl separation tower to remove HCl gas, fluorinating again at 150-300° in fixed- bed reactor packed with catalyst II, washing with water and alkaline solution, chlorinating at 15-80° under illuminating, washing with water and alkaline solution, drying, and rectifying. The catalyst I is SbCl<sub>5</sub> and/or SbCl<sub>3</sub>; and the catalyst II is the mixture of AlF<sub>3</sub> and Cr(OH)<sub>3</sub>. The catalyst adjuvant is chlorosulfonic acid or fluorosulfonic acid. The mole ratio of 1,1,1,3,3-pentachloropropane to HF is 1:7.0-8.5.

IT 7664-39-3, **Hydrofluoric acid**, reactions  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (process for preparation of 1,1,1,3,  
**3-pentafluoropropane**)

RN 7664-39-3 HCAPLUS

CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

IT 1645-83-6P 2730-43-0P, 1-Chloro-  
**3,3,3-trifluoropropene**  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT  
 (Reactant or reagent)  
 (process for preparation of 1,1,1,3,  
**3-pentafluoropropane**)

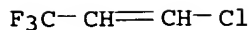
RN 1645-83-6 HCAPLUS

CN 1-Propene, 1,3,3,3-tetrafluoro- (9CI) (CA INDEX NAME)

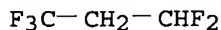
 $\text{F}_3\text{C}-\text{CH}=\text{CH}-\text{F}$ 

RN 2730-43-0 HCAPLUS

CN 1-Propene, 1-chloro-3,3,3-trifluoro- (9CI) (CA INDEX NAME)



IT 460-73-1P, 1,1,1,3,  
**3-Pentafluoropropane**  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (process for preparation of 1,1,1,3,  
**3-pentafluoropropane**)  
 RN 460-73-1 HCAPLUS  
 CN Propane, 1,1,1,3,3-pentafluoro- (6CI, 8CI, 9CI) (CA INDEX NAME)



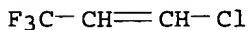
L27 ANSWER 6 OF 21 HCAPLUS COPYRIGHT 2005 ACS on STN  
 ACCESSION NUMBER: 2000:316662 HCAPLUS  
 DOCUMENT NUMBER: 132:310008  
 TITLE: Process and catalysts for preparing chlorofluorinated  
 propanes from **hydrogen fluoride**  
 and chlorofluoropropanes  
 INVENTOR(S): Boyce, C. Bradford; Belter, Randolph K.; Parker, Terry  
 PATENT ASSIGNEE(S): Laroche Industries, Inc., USA  
 SOURCE: U.S., 3 pp.  
 CODEN: USXXAM  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

*was* ✓  

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 6063970	A	20000516	US 1998-168240	19981008
PRIORITY APPLN. INFO.: OTHER SOURCE(S):		MARPAT 132:310008	US 1998-168240	19981008

AB **1-Chloro-1,3,3,3-tetrafluoropropane, 1-chloro-1,3,3-trifluoropropane, or 1,1-dichloro-1,3,3,3-tetrafluoropropane** are prepared in high yield and selectivity by reacting a chlorinated fluoropropene  $\text{CHaF}_3\text{-aCH:CHcCl}_2\text{-c}$  (a = 0-2; c = 0-1) (e.g., **1-chloro-1,3,3,3-tetrafluoropropene**) with anhydrous **hydrogen fluoride** and a catalyst selected from halides of tantalum, vanadium, and mixts. for a time and at a temperature sufficient to form the chlorofluoropropanes.

IT 2730-43-0, **1-Chloro-3,3,3-trifluoropropene 7664-39-3, Hydrogen fluoride, reactions**  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (process and catalysts for preparing chlorofluorinated propanes from **hydrogen fluoride** and chlorofluoropropanes)  
 RN 2730-43-0 HCAPLUS  
 CN 1-Propene, 1-chloro-3,3,3-trifluoro- (9CI) (CA INDEX NAME)



RN 7664-39-3 HCAPLUS

CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

REFERENCE COUNT: 1 THERE ARE 1 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L27 ANSWER 7 OF 21 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2000:137249 HCAPLUS

DOCUMENT NUMBER: 132:180279

TITLE: Preparation of fluoropropanes from halopropanes or  
halopropenes

INVENTOR(S): Hibino, Yasuo; Ishihara, Akira; Kaneda, Shozo

PATENT ASSIGNEE(S): Central Glass Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 9 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2000063301	A2	20000229	JP 1998-231968	19980818
PRIORITY APPLN. INFO.:			JP 1998-231968	19980818

OTHER SOURCE(S): CASREACT 132:180279; MARPAT 132:180279

AB C3H<sub>j</sub>F<sub>k</sub>X<sub>l</sub> (X = Cl, Br, I; j = 1-6; k = 2-7; l = 0-5; j + k + l = 8), useful  
as blowing agents and refrigerants (no data), are prepared by gas-phase  
fluorination of C3H<sub>a</sub>F<sub>b</sub>X<sub>c</sub> or C3H<sub>d</sub>F<sub>e</sub>X<sub>f</sub> (X = same as above; a, f = 1-6; b =  
0-6; c = 1-7; a + b + c = 8; d, e = 0-5; d + e + f = 6) by HF in the  
presence of Group IVa, IVb, Va, Vb, or VIb (other than Sb) metal halides  
as catalysts supported on activated C. Cl3CCH2CHCl2, HF, and Cl were  
passed through a reactor packed with TiCl4/C at 180° to give  
F3CCH2CHF2, F3CCH2CHFCl, and F3CCH2CHCl2.

IT 460-73-1P, 1,1,1,3,

3-Pentafluoropropane

RL: IMF (Industrial manufacture); PREP (Preparation)  
(preparation of fluoropropanes)

RN 460-73-1 HCAPLUS

CN Propane, 1,1,1,3,3-pentafluoro- (6CI, 8CI, 9CI) (CA INDEX NAME)

F<sub>3</sub>C-CH<sub>2</sub>-CHF<sub>2</sub>

IT 1645-83-6, 1,3,3,3-

Tetrafluoropropene 2730-43-0, 1-Chloro

-3,3,3-trifluoropropene

7664-39-3, Hydrogen fluoride, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

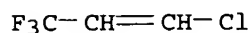
(preparation of fluoropropanes)

RN 1645-83-6 HCAPLUS

CN 1-Propene, 1,3,3,3-tetrafluoro- (9CI) (CA INDEX NAME)

F<sub>3</sub>C-CH=CH-F

RN 2730-43-0 HCAPLUS  
 CN 1-Propene, 1-chloro-3,3,3-trifluoro- (9CI) (CA INDEX NAME)



RN 7664-39-3 HCAPLUS  
 CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

L27 ANSWER 8 OF 21 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1999:626154 HCAPLUS

DOCUMENT NUMBER: 131:242970

TITLE: Process for producing 1,1,  
 1,3,3-

**pentafluoropropane**

INVENTOR(S): Yamamoto, Akinori; Shibata, Noriaki; Nakada, Tatsuo;  
 Shibamura, Takashi

PATENT ASSIGNEE(S): Daikin Industries Ltd., Japan

SOURCE: PCT Int. Appl., 23 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9948849	A1	19990930	WO 1999-JP537	19990205
W: CN, US				
RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
JP 11269105	A2	19991005	JP 1998-73626	19980323
JP 3518321	B2	20040412		
EP 1067106	A1	20010110	EP 1999-902854	19990205
R: BE, DE, ES, FR, GB, IT				
US 6472573	B1	20021029	US 2000-601511	20000802
PRIORITY APPLN. INFO.:			JP 1998-73626	A 19980323
			WO 1999-JP537	W 19990205

AB A process for producing 1,1,1,3,  
**3-pentafluoropropane (HFC-245fa)**  
 which comprises: a first step in which 1-chloro-  
**3,3,3-trifluoropropene (1233zd)** is  
 reacted with **hydrogen fluoride** in a gas phase to  
 mainly obtain 1,3,3,3-  
**tetrafluoropropene (1234ze)**; and a second step in which the  
**1,3,3,3-tetrafluoropropene**  
 (1234ze) is separated as an ingredient containing no hydrogen chloride from the  
 crude composition obtained in the first step and reacted with **hydrogen**  
**fluoride** in a gas phase to obtain 1,1,  
**1,3,3-pentafluoropropane (**  
**HFC-245fa)**. The process does not necessitate separation of  
 the **HFC-245fa** from the 1233zd. Thus, **HFC-**  
**245fa** can be economically produced.

IT 460-73-1P, 1,1,1,3,

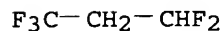
**3-Pentafluoropropane**

RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)

(preparation of 1,1,1,3,3-pentafluoropropane)

RN 460-73-1 HCAPLUS

CN Propane, 1,1,1,3,3-pentafluoro- (6CI, 8CI, 9CI) (CA INDEX NAME)



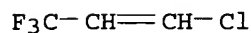
IT 2730-43-0, 1-Propene, 1-chloro-3,3,3-trifluoro-

RL: RCT (Reactant); RACT (Reactant or reagent)

(preparation of 1,1,1,3,3-pentafluoropropane)

RN 2730-43-0 HCAPLUS

CN 1-Propene, 1-chloro-3,3,3-trifluoro- (9CI) (CA INDEX NAME)



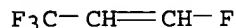
IT 1645-83-6P, 1,3,3,3-Tetrafluoropropene

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(preparation of 1,1,1,3,3-pentafluoropropane)

RN 1645-83-6 HCAPLUS

CN 1-Propene, 1,3,3,3-tetrafluoro- (9CI) (CA INDEX NAME)



REFERENCE COUNT: 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L27 ANSWER 9 OF 21 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1999:576671 HCAPLUS

DOCUMENT NUMBER: 131:171865

TITLE: Method and catalysts for producing fluorinated propane

INVENTOR(S): Hibino, Yasuo; Tamai, Ryouichi; Kaneda, Shouzou

PATENT ASSIGNEE(S): Central Glass Company, Limited, Japan

SOURCE: Eur. Pat. Appl., 19 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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EP 939071	A1	19990901	EP 1999-103578	19990224
EP 939071	B1	20030730		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
JP 2000007591	A2	20000111	JP 1999-27999	19990205

JP 3031464	B2	20000410		
JP 2000143561	A2	20000523	JP 1999-353925	19990205
JP 3154702	B2	20010409		
JP 2000007592	A2	20000111	JP 1999-48203	19990225
JP 3031465	B2	20000410		
PRIORITY APPLN. INFO.:			JP 1998-45088	A 19980226
			JP 1998-109586	A 19980420
			JP 1999-27999	A3 19990205

OTHER SOURCE(S): MARPAT 131:171865

AB An industrial-scale method for producing a fluorinated propane (e.g., 1,1,1,3,3-pentafluoropropane) comprises: (a) fluorinating a halogenated propane (e.g., 1,1,1,3,3-pentachloropropane) and/or a halogenated propene with HF in the gas phase in the presence of a first fluorination catalyst (e.g., fluorinated alumina) to produce a reaction gas containing a fluorinated propene (e.g., 1-chloro-3,3,3-trifluoropropene or 1,3,3,3-tetrafluoropropene); and (b) fluorinating the fluorinated propene with HF in the gas phase by transferring the reaction gas from step (a) to a reaction zone in which a second fluorination catalyst having an activated carbon support of a halide of a high-valence metal (e.g., SbCl<sub>5</sub>) is present to obtain the fluorinated propane.

IT 460-73-1P, 1,1,1,3,3-Pentafluoropropane 99728-16-2P 102687-65-0P  
 RL: IMF (Industrial manufacture); PREP (Preparation)  
 (method and catalysts for producing fluorinated propane)

RN 460-73-1 HCAPLUS

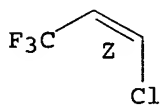
CN Propane, 1,1,1,3,3-pentafluoro- (6CI, 8CI, 9CI) (CA INDEX NAME)

F<sub>3</sub>C-CH<sub>2</sub>-CHF<sub>2</sub>

RN 99728-16-2 HCAPLUS

CN 1-Propene, 1-chloro-3,3,3-trifluoro-, (1Z)- (9CI) (CA INDEX NAME)

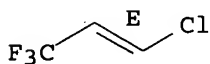
Double bond geometry as shown.



RN 102687-65-0 HCAPLUS

CN 1-Propene, 1-chloro-3,3,3-trifluoro-, (1E)- (9CI) (CA INDEX NAME)

Double bond geometry as shown.

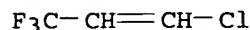


IT 2730-43-0P

RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)  
 (method and catalysts for producing fluorinated propane)

RN 2730-43-0 HCAPLUS

CN 1-Propene, 1-chloro-3,3,3-trifluoro- (9CI) (CA INDEX NAME)



IT 7664-39-3, Hydrogen fluoride, reactions  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (method and catalysts for producing fluorinated propane)  
 RN 7664-39-3 HCAPLUS  
 CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

REFERENCE COUNT: 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L27 ANSWER 10 OF 21 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1999:417973 HCAPLUS

DOCUMENT NUMBER: 131:87657

TITLE: Preparation of 1,1,1,  
 3,3-pentafluoropropane and  
 its intermediate

INVENTOR(S): Nakata, Tatsuo; Shibata, Noriaki; Shibamura, Satoshi

PATENT ASSIGNEE(S): Daikin Industries, Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 11180908	A2	19990706	JP 1997-350829	19971219
PRIORITY APPLN. INFO.:			JP 1997-350829	19971219

OTHER SOURCE(S): CASREACT 131:87657

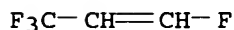
AB CF<sub>3</sub>CH<sub>2</sub>CHF<sub>2</sub> (I), useful as a Freon substitute, is prepared by treating CCl<sub>3</sub>CH<sub>2</sub>CHCl<sub>2</sub> (II) with HF in the absence of catalysts and fluorinating the resulting intermediates mainly containing CF<sub>3</sub>CH:CHCl (III) and CF<sub>3</sub>CH:CHF. II was autoclaved with HF at 200° and 100 kg/cm<sup>2</sup> for 5 h to give a product containing 82.76% III. The product gas was passed through a reactor packed with fluorinated Cr catalyst (prepared by treating Cr nitrate with NH<sub>3</sub>, calcining the resulting Cr hydroxide at 400°, and then fluorinating the calcined product) at 250° to give a product gas containing 53.38% I.

IT 1645-83-6P 2730-43-0P

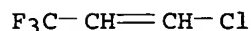
RL: IMF (Industrial manufacture); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
 (preparation of pentafluoropropane by two-step fluorination of pentachloropropane via trifluorochloropropene and/or tetrafluoropropene)

RN 1645-83-6 HCAPLUS

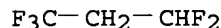
CN 1-Propene, 1,3,3,3-tetrafluoro- (9CI) (CA INDEX NAME)



RN 2730-43-0 HCAPLUS  
CN 1-Propene, 1-chloro-3,3,3-trifluoro- (9CI) (CA INDEX NAME)



IT 460-73-1P, 1,1,1,3,3-Pentafluoropropane  
RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)  
(preparation of pentafluoropropane by two-step fluorination of pentachloropropane via trifluorochloropropene and/or tetrafluoropropene)  
RN 460-73-1 HCAPLUS  
CN Propane, 1,1,1,3,3-pentafluoro- (6CI, 8CI, 9CI) (CA INDEX NAME)



IT 7664-39-3, Hydrogen fluoride, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(preparation of pentafluoropropane by two-step fluorination of pentachloropropane via trifluorochloropropene and/or tetrafluoropropene)  
RN 7664-39-3 HCAPLUS  
CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

L27 ANSWER 11 OF 21 HCAPLUS COPYRIGHT 2005 ACS on STN  
ACCESSION NUMBER: 1999:273587 HCAPLUS  
DOCUMENT NUMBER: 130:268843  
TITLE: Two-step process for the preparation of 1,1,1,3,3-pentafluoropropane from 1,1,1-trifluoro-3-chloro-2-propene  
INVENTOR(S): Elsheikh, Maher Y.; Bolmer, Michael S.; Chen, Bin  
PATENT ASSIGNEE(S): Elf Atochem North America, Inc., USA  
SOURCE: U.S., 3 pp.  
CODEN: USXXAM  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 5895825	A	19990420	US 1997-980747	19971201
EP 919529	A1	19990602	EP 1998-309797	19981130
EP 919529	B1	20011010		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
JP 11228461	A2	19990824	JP 1998-339093	19981130
MX 9810077	A	20000831	MX 1998-10077	19981130



ES 2163236	T3	20020116	ES 1998-309797	19981130
CN 1221722	A	19990707	CN 1998-123057	19981201
CN 1136174	B	20040128		

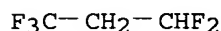
PRIORITY APPLN. INFO.: US 1997-980747 A 19971201

AB A process for preparing 1,1,1,3,3-pentafluoropropane (I), a blowing agent and refrigerant (no data), comprises: (A) fluorinating 1,1,1-trifluoro-3-chloro-2-propene with **hydrogen fluoride** in a first reaction zone to produce a mixture containing 1,1,1,3-tetrafluoro-2-propene (II); and (B) separating the 1,1,1,3-tetrafluoro-2-propene from the reaction mixture and hydrofluorinating it with **hydrogen fluoride** in a second reaction zone to I. The process advantages are that the II intermediate has a b.p. 35° lower than that of 1,1,1-trifluoro-3-chloro-2-propene so that it can be readily separated from I via distillation. Further, II readily reacts with HF, so that large excesses of HF are not required in step B, again simplifying recovery.

IT 460-73-1P, 1,1,1,3,3-Pentafluoropropane  
 RL: IMF (Industrial manufacture); PREP (Preparation)  
 (two-step process for the preparation of 1,1,1,3,3-pentafluoropropane from 1,1,1-trifluoro-3-chloro-2-propene)

RN 460-73-1 HCAPLUS

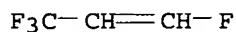
CN Propane, 1,1,1,3,3-pentafluoro- (6CI, 8CI, 9CI) (CA INDEX NAME)



IT 1645-83-6P, 1,1,1,3-Tetrafluoro-2-propene  
 RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)  
 (two-step process for the preparation of 1,1,1,3,3-pentafluoropropane from 1,1,1-trifluoro-3-chloro-2-propene)

RN 1645-83-6 HCAPLUS

CN 1-Propene, 1,3,3,3-tetrafluoro- (9CI) (CA INDEX NAME)



IT 2730-43-0, 3-Chloro-1,1,1-Trifluoro-2-propene  
 7664-39-3, Hydrogen fluoride, reactions  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (two-step process for the preparation of 1,1,1,3,3-pentafluoropropane from 1,1,1-trifluoro-3-chloro-2-propene)

RN 2730-43-0 HCAPLUS

CN 1-Propene, 1-chloro-3,3,3-trifluoro- (9CI) (CA INDEX NAME)



RN 7664-39-3 HCAPLUS

CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

REFERENCE COUNT: 1 THERE ARE 1 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L27 ANSWER 12 OF 21 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1999:250261 HCAPLUS

DOCUMENT NUMBER: 130:311526

TITLE: Preparation of halogenated propanes from halogenated  
**propenes**

INVENTOR(S): Tamai, Ryoichi; Yoshikawa, Satoru; Hibino, Yasuo

PATENT ASSIGNEE(S): Central Glass Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 11106358	A2	19990420	JP 1997-270106	19971002
PRIORITY APPLN. INFO.:			JP 1997-270106	19971002
OTHER SOURCE(S): CASREACT 130:311526; MARPAT 130:311526				
AB CF3-bClbCH2CHYZ (Y, Z = F, Cl; b = 0-3), useful as blowing agents, refrigerants, solvents, propellants, etc. (no data), are prepared by reaction of CF3-aClCH:CHX (X = F, Cl; a = 0-3) with HF under pressure in gas phases in the presence of fluorination catalysts. CF3CH:CHCl was treated with HF using Cr/activated C at 270° under 0.5 MPa to give 79.4% CF3CH2CHF2.				
IT 460-73-1P, 1,1,1,3,3-Pentafluoropropane				
RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)				
(preparation of fluoropropanes by fluorination of fluoropropenes with metal catalysts supported on base- or acid-treated activated C)				
RN 460-73-1 HCAPLUS				
CN Propane, 1,1,1,3,3-pentafluoro- (6CI, 8CI, 9CI) (CA INDEX NAME)				

F<sub>3</sub>C-CH<sub>2</sub>-CHF<sub>2</sub>

IT 1645-83-6, 1,3,3,3-

Tetrafluoropropene 2730-43-0, 1-Chloro

-3,3,3-trifluoro-1-

propene 7664-39-3, Hydrogen fluoride

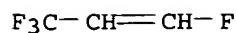
, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

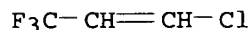
(preparation of fluoropropanes by fluorination of fluoropropenes with metal catalysts supported on base- or acid-treated activated C)

RN 1645-83-6 HCAPLUS

CN 1-Propene, 1,3,3,3-tetrafluoro- (9CI) (CA INDEX NAME)



RN 2730-43-0 HCAPLUS  
 CN 1-Propene, 1-chloro-3,3,3-trifluoro- (9CI) (CA INDEX NAME)



RN 7664-39-3 HCAPLUS  
 CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

L27 ANSWER 13 OF 21 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1998:621173 HCAPLUS

DOCUMENT NUMBER: 129:230447

TITLE: Process for producing 1,1,  
 1,3,3-

**pentafluoropropane**

INVENTOR(S): Nakada, Tatsuo; Yamamoto, Akinori; Shibata, Noriaki;  
 Shibamura, Takashi

PATENT ASSIGNEE(S): Daikin Industries Ltd., Japan

SOURCE: PCT Int. Appl., 23 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9840335	A1	19980917	WO 1998-JP932	19980305
W: US				
RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
JP 10309464	A2	19981124	JP 1997-134897	19970526
PRIORITY APPLN. INFO.:			JP 1997-57561	A 19970312
			JP 1997-134897	A 19970526

OTHER SOURCE(S): CASREACT 129:230447

AB A tetrahalogenopropane as a starting material is chlorofluorinated by reacting it preferably with chlorine and **hydrofluoric acid** in the presence of a metal catalyst to thereby obtain 1,1,1,3,3-

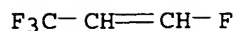
**pentafluoropropane**. Thus, 1,1,1,3,3-**pentafluoropropane** is easily produced from a material which is available or can be synthesized inexpensively.

IT 1645-83-6P 2730-43-0P

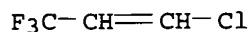
RL: BYP (Byproduct); PREP (Preparation)  
 (process for producing 1,1,1,3,3-**pentafluoropropane**)

RN 1645-83-6 HCAPLUS

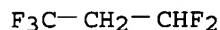
CN 1-Propene, 1,3,3,3-tetrafluoro- (9CI) (CA INDEX NAME)



RN 2730-43-0 HCAPLUS  
 CN 1-Propene, 1-chloro-3,3,3-trifluoro- (9CI) (CA INDEX NAME)



IT 460-73-1P, 1,1,1,3,  
 3-Pentafluoropropane  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (process for producing 1,1,1,3,  
 3-pentafluoropropane)  
 RN 460-73-1 HCAPLUS  
 CN Propane, 1,1,1,3,3-pentafluoro- (6CI, 8CI, 9CI) (CA INDEX NAME)



REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS  
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L27 ANSWER 14 OF 21 HCAPLUS COPYRIGHT 2005 ACS on STN  
 ACCESSION NUMBER: 1998:618407 HCAPLUS  
 DOCUMENT NUMBER: 129:218231  
 TITLE: Process and catalysts for the gas-phase fluorination  
 of 1,1,3,3-tetrachloro-2-propene with **hydrogen**  
**fluoride** in the high-yield manufacture of  
 1,1,1,3,  
 3-pentafluoropropane and its  
 synthetic precursors  
 INVENTOR(S): Elsheikh, Maher Y.  
 PATENT ASSIGNEE(S): Elf Atochem North America, Inc., USA  
 SOURCE: U.S., 3 pp.  
 CODEN: USXXAM  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 5811603	A	19980922	US 1997-980746	19971201
CA 2233528	C	20011023	CA 1998-2233528	19980521
CA 2233528	AA	19990601		
JP 11199529	A2	19990727	JP 1998-160016	19980526
EP 919527	A1	19990602	EP 1998-304230	19980528
EP 919527	B1	20020220		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
CN 1218789	A	19990609	CN 1998-109486	19980528
CN 1136172	B	20040128		
ES 2172086	T3	20020916	ES 1998-304230	19980528
PRIORITY APPLN. INFO.:			US 1997-980746	A 19971201
AB 1,1,1,3,3-				
Pentafluoropropane, useful as a foam-blowing agent (no data) and				

refrigerant (no data), and its synthetic precursors 1,1,1-trifluoro-3-chloro-2-propene and 1,1,1,3-

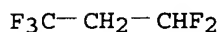
tetrafluoro-2-propene, are prepared in high yield and without oligomer formation by the gas-phase fluorination of 1,1,3,3-tetrachloro-2-propene with HF in the presence of an aluminum fluoride or chromium-based (e.g., HF-activated Cr<sub>2</sub>O<sub>3</sub>) fluorination catalyst, followed by product separation

IT 460-73-1P, 1,1,1,3,  
3-Pentafluoropropane 1645-83-6P  
2730-43-0P

RL: IMF (Industrial manufacture); PREP (Preparation)  
(process and catalysts for the gas-phase fluorination of  
1,1,3,3-tetrachloro-2-propene with **hydrogen fluoride**  
in the high-yield manufacture of 1,1,1,  
3,3-pentafluoropropane and its synthetic  
precursors)

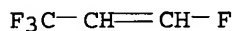
RN 460-73-1 HCAPLUS

CN Propane, 1,1,1,3,3-pentafluoro- (6CI, 8CI, 9CI) (CA INDEX NAME)



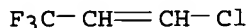
RN 1645-83-6 HCAPLUS

CN 1-Propene, 1,3,3,3-tetrafluoro- (9CI) (CA INDEX NAME)



RN 2730-43-0 HCAPLUS

CN 1-Propene, 1-chloro-3,3,3-trifluoro- (9CI) (CA INDEX NAME)



IT 7664-39-3, **Hydrogen fluoride**, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)  
(process and catalysts for the gas-phase fluorination of  
1,1,3,3-tetrachloro-2-propene with **hydrogen fluoride**  
in the high-yield manufacture of 1,1,1,  
3,3-pentafluoropropane and its synthetic  
precursors)

RN 7664-39-3 HCAPLUS

CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

REFERENCE COUNT: 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L27 ANSWER 15 OF 21 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1998:62263 HCAPLUS

DOCUMENT NUMBER: 128:90318

TITLE: Vapor-phase fluorination process and catalysts for the  
manufacture of 1,1,1,  
3,3-pentafluoropropane

INVENTOR(S): Tung, Hsueh Sung  
 PATENT ASSIGNEE(S): Alliedsignal Inc., USA  
 SOURCE: U.S., 5 pp.  
 CODEN: USXXAM  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

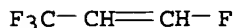
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 5710352	A	19980120	US 1996-716013	19960919
WO 9812161	A1	19980326	WO 1997-US16966	19970919
W: JP, KR				
RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
EP 931043	A1	19990728	EP 1997-942663	19970919
EP 931043	B1	20030813		
R: DE, ES, FR, GB, IT, NL				
JP 2001500882	T2	20010123	JP 1998-514990	19970919
JP 3393142	B2	20030407		
ES 2137143	T3	20040501	ES 1997-942663	19970919
PRIORITY APPLN. INFO.:			US 1996-716013	A 19960919
			WO 1997-US16966	W 19970919

AB In the title process, 1,1,1,3, 3-pentafluoropropane (HFC-245fa) is prepared by the vapor-phase fluorination of 1,1,1,3,3-pentachloropropane (HCC-240fa) with HF in the presence of a Group IVB or VB metal halide catalyst. The byproducts, 1-chloro-3, 3,3-trifluoropropene and 1,3,3,3-tetrafluoropropene, are distilled from the HFC-245fa and recycled for further HF fluorination thus producing a >99% HCC-240fa conversion. The title vapor-phase fluorination process is less corrosive than a comparable liquid-phase process.

IT 1645-83-6P, 1,3,3,3-Tetrafluoropropene 2730-43-0P  
 RL: BYP (Byproduct); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)  
 (vapor-phase fluorination process and catalysts for the manufacture of 1,1,1,3,3-pentafluoropropane)

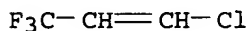
RN 1645-83-6 HCAPLUS

CN 1-Propene, 1,3,3,3-tetrafluoro- (9CI) (CA INDEX NAME)



RN 2730-43-0 HCAPLUS

CN 1-Propene, 1-chloro-3,3,3-trifluoro- (9CI) (CA INDEX NAME)



IT 460-73-1P, 1,1,1,3, 3-Pentafluoropropane  
 RL: IMF (Industrial manufacture); PREP (Preparation)  
 (vapor-phase fluorination process and catalysts for the manufacture of 1,1,1,3,3-pentafluoropropane)

RN 460-73-1 HCAPLUS  
 CN Propane, 1,1,1,3,3-pentafluoro- (6CI, 8CI, 9CI) (CA INDEX NAME)


$F_3C-CH_2-CHF_2$

IT 7664-39-3, Hydrogen fluoride, reactions  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (vapor-phase fluorination process and catalysts for the manufacture of  
 1,1,1,3,3-  
 pentafluoropropane)  
 RN 7664-39-3 HCAPLUS  
 CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

REFERENCE COUNT: 1 THERE ARE 1 CITED REFERENCES AVAILABLE FOR THIS  
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

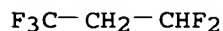
L27 ANSWER 16 OF 21 HCAPLUS COPYRIGHT 2005 ACS on STN  
 ACCESSION NUMBER: 1998:56058 HCAPLUS  
 DOCUMENT NUMBER: 128:114713  
 TITLE: Preparation of 1,1,1,  
 3,3-pentafluoropropane  
 INVENTOR(S): Saku, Fuyuhiko; Hibino, Yasuo  
 PATENT ASSIGNEE(S): Central Glass Co., Ltd., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 4 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 3  
 PATENT INFORMATION:

 PATENT NO. KIND DATE APPLICATION NO. DATE  
 -----  
 JP 10017502 A2 19980120 JP 1996-171097 19960701  
 US 6111150 A 20000829 US 1996-764496 19961212  
 PRIORITY APPLN. INFO.: JP 1996-159998 A 19960620  
 JP 1996-159999 A 19960620  
 JP 1996-171097 A 19960701

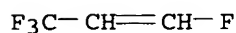
OTHER SOURCE(S): CASREACT 128:114713

AB Title compound (I), useful as blowing agent for polyurethane foams and  
 refrigerant (no data), is prepared by addition of 1,3,  
 3,3-tetrafluoropropene (II) with HF in the  
 presence of halogenated hydrogenation catalysts. II was treated with HF  
 in the presence of SbCl<sub>5</sub> at 50° for 3.5 h to give I with 98%  
 selectivity.

IT 460-73-1P, 1,1,1,3,  
 3-Pentafluoropropane  
 RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP  
 (Preparation)  
 (preparation of pentafluoropropane by addition of tetrafluoropropene with HF  
 using catalysts)  
 RN 460-73-1 HCAPLUS  
 CN Propane, 1,1,1,3,3-pentafluoro- (6CI, 8CI, 9CI) (CA INDEX NAME)



IT 1645-83-6, 1,3,3,3-  
**Tetrafluoropropene** 7664-39-3, Hydrogen  
 fluoride, reactions  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (preparation of pentafluoropropane by addition of tetrafluoropropene with HF  
 using catalysts)  
 RN 1645-83-6 HCAPLUS  
 CN 1-Propene, 1,3,3,3-tetrafluoro- (9CI) (CA INDEX NAME)



RN 7664-39-3 HCAPLUS  
 CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

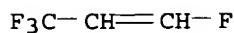
L27 ANSWER 17 OF 21 HCAPLUS COPYRIGHT 2005 ACS on STN  
 ACCESSION NUMBER: 1998:38666 HCAPLUS  
 DOCUMENT NUMBER: 128:101817  
 TITLE: Preparation of 1,3,3,  
 3-**tetrafluoropropene**  
 INVENTOR(S): Yoshikawa, Satoshi; Tamai, Yoshikazu; Hibino, Yasuo  
 PATENT ASSIGNEE(S): Central Glass Co., Ltd., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 4 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 3  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 10007604	A2	19980113	JP 1996-159998	19960620
JP 3465865	B2	20031110		
US 6111150	A	20000829	US 1996-764496	19961212
PRIORITY APPLN. INFO.:			JP 1996-159998	A 19960620
			JP 1996-159999	A 19960620
			JP 1996-171097	A 19960701

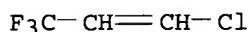
AB The compound (I), useful as a refrigerant and intermediate for drugs and agrochemicals, etc., is prepared by gas-phase reaction of  $\text{ClCH}:\text{CHCF}_3$  (II) with HF in the presence of fluorination catalysts. HF/N and II were passed through a reactor packed with  $\text{Cr}_2\text{O}_3/\text{C}$  pretreated with HF at  $400^\circ$  for 3 h to give 6.0 g product containing 73.0% I.

IT 1645-83-6P, 1,3,3,3-  
**Tetrafluoropropene**  
 RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP  
 (Preparation)  
 (preparation of tetrafluoropropene by catalytic fluorination of  
 chlorotrifluoropropene with HF)  
 RN 1645-83-6 HCAPLUS  
 CN 1-Propene, 1,3,3,3-tetrafluoro- (9CI) (CA INDEX NAME)





IT 2730-43-0, 1-Propene, 1-chloro-  
 3,3,3-trifluoro- 7664-39-3  
 , Hydrogen fluoride, reactions  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (preparation of tetrafluoropropene by catalytic fluorination of  
 chlorotrifluoropropene with HF)  
 RN 2730-43-0 HCAPLUS  
 CN 1-Propene, 1-chloro-3,3,3-trifluoro- (9CI) (CA INDEX NAME)



RN 7664-39-3 HCAPLUS  
 CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

L27 ANSWER 18 OF 21 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1997:678659 HCAPLUS

DOCUMENT NUMBER: 127:346115

TITLE: Preparation of 1,1,1,  
 3,3-pentafluoropropane

INVENTOR(S): Tamai, Ryoichi; Yoshikawa, Satoru; Saku, Fuyuhiko;  
 Hibino, Yasuo

PATENT ASSIGNEE(S): Central Glass Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 4 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 09268139	A2	19971014	JP 1996-81556	19960403
PRIORITY APPLN. INFO.:			JP 1996-81556	19960403

OTHER SOURCE(S): CASREACT 127:346115

AB 1,1,1,3,3-

**Pentafluoropropane** (I), a known foaming agent for polyurethanes and refrigerant, is prepared by reacting 1,1,1,3,3-pentachloropropane (II) with HF in the gas phase in the presence of a fluorination catalyst. Thus, an aqueous solution of  $\text{CrCl}_3 \cdot 6\text{H}_2\text{O}$  was mixed with  $\gamma$ -alumina; after filtration, the  $\gamma$ -alumina was dried and heated at  $300^\circ$  under nitrogen and then under a mixture of nitrogen and HF; finally, the resulting powder was heated at  $450^\circ$  for 1 h to give a catalyst. Reaction of II with HF in the gas phase at  $450^\circ$  in the presence of the above catalyst gave a product containing 13.6% I and other byproducts.

IT 1645-83-6P, 1,3,3,3-

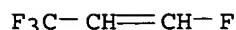
**Tetrafluoropropene** 2730-43-0P

RL: BYP (Byproduct); PREP (Preparation)

(preparation of pentafluoropropane)

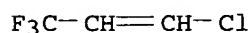
RN 1645-83-6 HCAPLUS

CN 1-Propene, 1,3,3,3-tetrafluoro- (9CI) (CA INDEX NAME)



RN 2730-43-0 HCAPLUS

CN 1-Propene, 1-chloro-3,3,3-trifluoro- (9CI) (CA INDEX NAME)

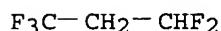


IT 460-73-1P, 1,1,1,3,  
3-Pentafluoropropane

RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP  
(Preparation)  
(preparation of pentafluoropropane)

RN 460-73-1 HCAPLUS

CN Propane, 1,1,1,3,3-pentafluoro- (6CI, 8CI, 9CI) (CA INDEX NAME)



IT 7664-39-3, Hydrogen fluoride, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)  
(preparation of pentafluoropropane)

RN 7664-39-3 HCAPLUS

CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

L27 ANSWER 19 OF 21 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1997:481000 HCAPLUS

DOCUMENT NUMBER: 127:95018

TITLE: Process for producing 1,1,  
1,3,3-  
pentafluoropropane by fluorination of  
1,1,1,3,3-pentachloropropane

INVENTOR(S): Nakada, Tatsuo; Aoyama, Hirokazu; Yamamoto, Akinori

PATENT ASSIGNEE(S): Daikin Industries Ltd., Japan

SOURCE: PCT Int. Appl., 18 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9724307	A1	19970710	WO 1996-JP2942	19961008
W:	AM, AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, KE, KG, KR, KZ, LK, LR, LT, LU, LV, MD, MG, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TT, UA, US, UZ, VN			
RW:	KE, LS, MW, SD, SZ, UG, AT, BE, CH, DE, DK, ES, FI, FR, GB, GR,			

IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, ML,  
MR, NE, SN, TD, TG

JP 09183740	A2	19970715	JP 1995-354118	19951229
CA 2241131	AA	19970710	CA 1996-2241131	19961008
CA 2241131	C	20011204		
AU 9672275	A1	19970728	AU 1996-72275	19961008
AU 704997	B2	19990513		
EP 877009	A1	19981111	EP 1996-933611	19961008
EP 877009	B1	20020403		
R: BE, DE, ES, FR, GB, IT, NL				
CN 1206394	A	19990127	CN 1996-199419	19961008
CN 1067043	B	20010613		
BR 9612297	A	19990713	BR 1996-12297	19961008
ES 2174108	T3	20021101	ES 1996-933611	19961008
CN 1224410	A	19990728	CN 1997-196154	19970321
US 6018084	A	20000125	US 1998-91820	19980625
PRIORITY APPLN. INFO.:			JP 1995-354118	A 19951229
			WO 1996-JP2942	W 19961008

OTHER SOURCE(S): CASREACT 127:95018

AB Characterized is a process for producing 1,1,1,3,3,3-pentafluoropropane (I) using fluorination catalyst which involves (1) gas-phase reacting 1,1,1,3,3-pentachloropropane with HF to thereby give 1,1,1-trifluoro-3-chloro-2-propene (II); and (2) gas-phase reacting II with HF to thereby give I; wherein II obtained in the first step is fed into the second step after eliminating HCl formed as the byproduct therefrom. Thus, an economical and novel process for producing I, which is an useful as foaming and blowing agents, can be provided in a high yield with a good selectivity.

IT 1645-83-6P 2730-43-0P

RL: IMF (Industrial manufacture); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(process for producing 1,1,1,3,3-pentafluoropropane by fluorination of 1,1,1,3,3-pentachloropropane)

RN 1645-83-6 HCAPLUS

CN 1-Propene, 1,3,3,3-tetrafluoro- (9CI) (CA INDEX NAME)

$\text{F}_3\text{C}-\text{CH}=\text{CH}-\text{F}$

RN 2730-43-0 HCAPLUS

CN 1-Propene, 1-chloro-3,3,3-trifluoro- (9CI) (CA INDEX NAME)

$\text{F}_3\text{C}-\text{CH}=\text{CH}-\text{Cl}$

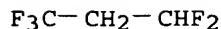
IT 460-73-1P, 1,1,1,3,3-Pentafluoropropane

RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)

(process for producing 1,1,1,3,3-pentafluoropropane by fluorination of 1,1,1,3,3-pentachloropropane)

RN 460-73-1 HCAPLUS

CN Propane, 1,1,1,3,3-pentafluoro- (6CI, 8CI, 9CI) (CA INDEX NAME)



IT 7664-39-3, Hydrogen fluoride, reactions  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (process for producing 1,1,1,3,3-pentafluoropropane by fluorination of  
 1,1,1,3,3-pentachloropropane)  
 RN 7664-39-3 HCAPLUS  
 CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

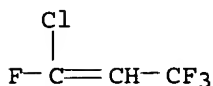
L27 ANSWER 20 OF 21 HCAPLUS COPYRIGHT 2005 ACS on STN  
 ACCESSION NUMBER: 1952:5631 HCAPLUS  
 DOCUMENT NUMBER: 46:5631  
 ORIGINAL REFERENCE NO.: 46:1022g-i  
 TITLE: Hydrofluorination of halogenated olefins  
 INVENTOR(S): Arnold, Robert C.  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Unavailable  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2560838	US	19510717	US	

AB Halogenated olefins are fluorinated with anhydrous HF in the presence of BF<sub>3</sub> (I) by using approx. 0.5 mole of the olefin to 1 mole HF with from 0.5 to 25 g. I in a closed vessel at 30-160°. E.g. when 40 g. HF was added to 131.5 g. CHCl:CCl<sub>2</sub> in an autoclave cooled to -30°, the vessel closed, 12 g. I added from a cylinder by means of a needle valve, the valve closed, the charge heated 24 hrs. to 95°, the vessel cooled in ice water, the contents poured over cracked ice, the mixture neutralized with NaOH, the organic material separated by steam distillation, dried over

CaCl<sub>2</sub>, fractionated, the olefin in the fraction distilling at 85-8° destroyed with permanganate solution, CH<sub>2</sub>ClCCl<sub>2</sub>F was obtained in 56.5% yield and a difluorinated product in 9% yield. With 40 g. HF, 0.5 mole olefin, and varying amts. of I, the following conversions are reported: 25.5% CH<sub>2</sub>ClCHClF from (:CHCl)<sub>2</sub> and 12 g. I, 9.5% with 3 g. I, and 21.4% with 6 g. I; 35.0% MeCClFCH<sub>2</sub>Cl and 4.4% MeCF<sub>2</sub>CH<sub>2</sub>Cl from MeCCl:CHCl with 2 g. I; 12.3% CHCl<sub>2</sub>CCl<sub>2</sub>F from (:CCl<sub>2</sub>)<sub>2</sub> with 24 g. I and only 6.4% with 6 g. I; 12.0% CF<sub>3</sub>CHClCCl<sub>2</sub>F from CF<sub>3</sub>CCl:CCl<sub>2</sub> with g. I, but only 8% with 10 g. I; 70.0% CF<sub>3</sub>CH<sub>2</sub>CClF<sub>2</sub> from CF<sub>3</sub>CH:CClF with 3 g. I.

IT 460-71-9, Propene, 1-chloro-1,3,3,3-tetrafluoro-  
 (reaction (addition) with HF)  
 RN 460-71-9 HCAPLUS  
 CN 1-Propene, 1-chloro-1,3,3,3-tetrafluoro- (9CI) (CA INDEX NAME)



IT 7664-39-3, Hydrofluoric acid  
 (reaction with olefins)  
 RN 7664-39-3 HCAPLUS  
 CN Hydrofluoric acid (8CI, 9CI) (CA INDEX NAME)

HF

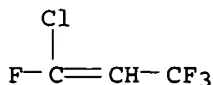
L27 ANSWER 21 OF 21 HCAPLUS COPYRIGHT 2005 ACS on STN  
 ACCESSION NUMBER: 1948:18889 HCAPLUS  
 DOCUMENT NUMBER: 42:18889  
 ORIGINAL REFERENCE NO.: 42:4034g-i,4035a-c  
 TITLE: Hydrofluorination in the presence of boron fluoride  
 AUTHOR(S): Henne, Albert L.; Arnold, Robert C.  
 CORPORATE SOURCE: Ohio State Univ., Columbus  
 SOURCE: Journal of the American Chemical Society (1948), 70,  
 758-60  
 CODEN: JACSAT; ISSN: 0002-7863

DOCUMENT TYPE: Journal  
 LANGUAGE: Unavailable

GI For diagram(s), see printed CA Issue.

AB The authors studied the addition of HF to  $\text{CHCl}:\text{CCl}_2$ ,  $\text{CHCl}:\text{CHCl}$ ,  $\text{CF}_2:\text{CCl}_2$ ,  $\text{CFCl}:\text{CFCl}$ ,  $\text{CFCl}:\text{CCl}_2$ ,  $\text{CCl}_2:\text{CCl}_2$ ,  $\text{CHCl}:\text{CF}_2$ ,  $\text{CF}_3\text{CCl}:\text{CCl}_2$ ,  $\text{CF}_3\text{CH}:\text{CClF}$ ,  $\text{CH}_3\text{CH}:\text{CHCl}$ , and  $\text{CH}_3\text{CCl}:\text{CHCl}$ . The addition is accelerated or made possible by using small amts. of  $\text{BF}_3$  as a catalyst. The observed results were explained by the formation of a coordinated complex  $\text{HF} \rightarrow \text{BF}_3$ , which enhances the ionic character of the H-F bond; this facilitates the separation of H as a proton, and makes it more available for addition to the more neg. of the double-bonded carbons. In support of this interpretation is the opposite fact that HF addition to alkynes is slowed down by an oxygenated solvent such as ether or acetone; in this case, complex formation with solvent involves H-bonding to the unshared electrons of the O atom and obstructs separation as a proton for the first stage of addition to the C.tplbond.C bond. The direction of addition was always that expected from the ionic character of the olefin. The vinylic halides acted as if entirely in their resonating form:  $\text{CH}_2\text{-C:X+H}$ , so that  $\text{RR}'\text{C:CR}''\text{X}$  leads exclusively to  $\text{HRR}'\text{C:CR}''\text{XF+}$ . By induction a  $\text{CF}_3$  group attached to a doubly bonded C atom causes a polarization opposed to that created by a  $\text{CH}_3$  group, so that the polarization of propene and trifluoropropene could be represented as  $\text{CH}_3\text{C+H:C-CH}_2$  and  $\text{CF}_3\text{C-H:C+H}_2$ , resp. The ease of addition was not determined solely by the extent of polarization of the double bond. The absolute electron d. around the double bond should also be taken into account; if this is done, it is to be expected that all ethylenes bearing a  $\text{CF}_3$  group should be slowed down by electron drainage away from the double bond. This explanation is similar to that used for the m-directing effect of an electroneg. group on a benzene ring, and its retarding effect.

IT 460-71-9, Propene, 1-chloro-  
 1,3,3,3-tetrafluoro-  
 (reaction with HF)  
 RN 460-71-9 HCAPLUS  
 CN 1-Propene, 1-chloro-1,3,3,3-tetrafluoro- (9CI) (CA INDEX NAME)



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L1 21 SEA FILE=REGISTRY ABB=ON PLU=ON C3H2F4/MF  
 L2 3 SEA FILE=REGISTRY ABB=ON PLU=ON L1 AND 1 (W) 3 (W) 3 (W) 3 (W) TETRAFLUORO?  
 L3 15 SEA FILE=REGISTRY ABB=ON PLU=ON C3H2CLF3/MF  
 L4 3 SEA FILE=REGISTRY ABB=ON PLU=ON L3 AND 3 (W) 3 (W) 3 (W) TRIFLUORO? AND 1 (W) CHLORO?  
 L5 15 SEA FILE=REGISTRY ABB=ON PLU=ON C3HCLF4/MF  
 L6 3 SEA FILE=REGISTRY ABB=ON PLU=ON L5 AND 1 (W) 3 (W) 3 (W) 3 (W) TETRAFLUORO? AND 1 (W) CHLORO?  
 L7 7 SEA FILE=REGISTRY ABB=ON PLU=ON C3H3F5/MF  
 L8 1 SEA FILE=REGISTRY ABB=ON PLU=ON L7 AND 1 (W) 1 (W) 1 (W) 3 (W) 3 (W) PENTAFLUORO?  
 L9 108 SEA FILE=HCAPLUS ABB=ON PLU=ON L2 OR (1 (W) 3 (W) 3 (W) 3 (W) TETRAFLUORO? AND PROPEN?)  
 L10 SEL PLU=ON L2 1- CHEM : 9 TERMS  
 L11 64 SEA FILE=HCAPLUS ABB=ON PLU=ON L10  
 L12 113 SEA FILE=HCAPLUS ABB=ON PLU=ON L11 OR L9  
 L13 SEL PLU=ON L4 1- CHEM : 7 TERMS  
 L14 69 SEA FILE=HCAPLUS ABB=ON PLU=ON L13  
 L15 140 SEA FILE=HCAPLUS ABB=ON PLU=ON L14 OR (1 (W) CHLORO?) (L) (3 (W) 3 (W) 3 (W) TRIFLUORO?)  
 L16 SEL PLU=ON L6 1- CHEM : 4 TERMS  
 L17 12 SEA FILE=HCAPLUS ABB=ON PLU=ON L16  
 L18 29 SEA FILE=HCAPLUS ABB=ON PLU=ON L17 OR (1 (W) CHLORO?) (L) (3 (W) 3 (W) 3 (W) TETRAFLUORO?)  
 L19 SEL PLU=ON L8 1- CHEM : 9 TERMS  
 L20 652 SEA FILE=HCAPLUS ABB=ON PLU=ON L19  
 L21 831 SEA FILE=HCAPLUS ABB=ON PLU=ON L20 OR (1 (W) 1 (W) 1 (W) 3 (W) 3 (W) PENTAFLUORO?)  
 L22 46 SEA FILE=HCAPLUS ABB=ON PLU=ON L12 AND (L15 OR L18 OR L21)  
 L23 39 SEA FILE=REGISTRY ABB=ON PLU=ON HYDROGEN FLUORIDE?/CN  
 L24 SEL PLU=ON L23 1- CHEM : 173 TERMS  
 L25 46497 SEA FILE=HCAPLUS ABB=ON PLU=ON L24  
 L26 46497 SEA FILE=HCAPLUS ABB=ON PLU=ON L25 OR HYDROGEN (W) FLUORIDE?  
 L27 21 SEA FILE=HCAPLUS ABB=ON PLU=ON L22 AND L26  
 L29 1341 SEA FILE=REGISTRY ABB=ON PLU=ON SODIUM HYDROXIDE?/CN OR POTASSIUM HYDROXIDE?/CN OR CALCIUM OXIDE?/CN OR CALCIUM DIHYDROXIDE?/CN OR CALCIUM HYDROXIDE?/CN OR CALCIUM OXIDE?  
 L30 1372 SEA FILE=REGISTRY ABB=ON PLU=ON L29 OR CAUSTIC  
 L31 740910 SEA FILE=HCAPLUS ABB=ON PLU=ON L30 OR (SODIUM OR POTASSIUM OR CALCIUM) (W) ?HYDROXIDE? OR CALCIUM (W) OXIDE? OR KOH OR NaOH OR CAO OR CAO H  
 L32 11 SEA FILE=HCAPLUS ABB=ON PLU=ON (L22 AND L31) NOT L27

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L32 ANSWER 1 OF 11 HCAPLUS COPYRIGHT 2005 ACS on STN  
 ACCESSION NUMBER: 2003:242042 HCAPLUS  
 DOCUMENT NUMBER: 138:255639  
 TITLE: Process for producing fluoroolefins

INVENTOR(S): Nair, Haridasan K.; Van der Puy, Michael; Nalewajek, David; Demmin, Timothy R.; Poss, Andrew J.; Bradley, David E.; Shankland, Ian R.  
 PATENT ASSIGNEE(S): USA  
 SOURCE: U.S. Pat. Appl. Publ., 6 pp.  
 CODEN: USXXCO  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

*State*

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2003060670	A1	20030327	US 2001-962974	20010925
US 6548719	B2	20030415		
WO 2003027051	A1	20030403	WO 2002-US30353	20020925
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZM, ZW			
RW:	GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG			
EP 1430011	A1	20040623	EP 2002-773563	20020925
R:	AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, SK			
JP 2005504097	T2	20050210	JP 2003-530643	20020925
PRIORITY APPLN. INFO.:			US 2001-962974	A 20010925
			WO 2002-US30353	W 20020925

OTHER SOURCE(S): MARPAT 138:255639

AB A process for producing a fluoroolefin of the formula:  $CF_3CY:CX_nHp$  wherein Y = hydrogen atom or a halogen atom (i.e., fluorine, chlorine, bromine, or iodine); X = a hydrogen atom or a halogen atom (i.e., fluorine, chlorine, bromine, or iodine); n and p = integers 0, 1, or 2, provided that (n + p) = 2; comprising contacting, in the presence of a phase transfer catalyst, a compound of the formula:  $CF_3C(R_1aR_2b)C(R_3cR_4d)$ , wherein R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, and R<sub>4</sub> = independently a hydrogen atom or a halogen selected from the group consisting of fluorine, chlorine, bromine, and iodine, provided that at least one of R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, and R<sub>4</sub> = halogen and there is at least one hydrogen and one halogen on adjacent carbon atoms; a and b are independently = 0, 1, or 2 and (a + b) = 2; and c and d = 0, 1, 2, or 3 and (c + d) = 3; and at least one alkali metal hydroxide. The alkali metal hydroxide can be, for example, potassium or sodium hydroxide and the phase transfer catalyst can be, for example, at least one: crown ether such as 18-crown-6 and 15-crown-5; or onium salt such as, quaternary phosphonium salt and quaternary ammonium salt. The olefin is useful, for example, as an intermediate for producing other industrial chems. and as a monomer for producing oligomers and polymers.

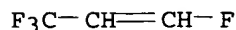
IT 1310-58-3, Potassium hydroxide, uses  
 RL: CAT (Catalyst use); USES (Uses)  
 (process for producing fluoroolefins)

RN 1310-58-3 HCAPLUS

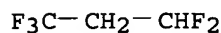
CN Potassium hydroxide (K(OH)) (9CI) (CA INDEX NAME)

K-OH

IT 1645-83-6P  
 RL: IMF (Industrial manufacture); PREP (Preparation)  
 (process for producing fluoroolefins)  
 RN 1645-83-6 HCAPLUS  
 CN 1-Propene, 1,3,3,3-tetrafluoro- (9CI) (CA INDEX NAME)



IT 460-73-1, HFC-245fa  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (process for producing fluoroolefins)  
 RN 460-73-1 HCAPLUS  
 CN Propane, 1,1,1,3,3-pentafluoro- (6CI, 8CI, 9CI) (CA INDEX NAME)



L32 ANSWER 2 OF 11 HCAPLUS COPYRIGHT 2005 ACS on STN  
 ACCESSION NUMBER: 2000:68192 HCAPLUS  
 DOCUMENT NUMBER: 132:93787  
 TITLE: Dehydrofluorination process and catalysts for the  
 preparation of 1,1,1,  
 3-tetrafluoro-2-  
 propenes from 1,1,  
 1,3,3-  
 pentafluoropropane  
 INVENTOR(S): Elsheikh, Maher Yousef; Fellerger, Paul David  
 PATENT ASSIGNEE(S): Elf Atochem North America, Inc., USA; Atofina  
 Chemicals  
 SOURCE: Eur. Pat. Appl., 3 pp.  
 CODEN: EPXXDW  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 974571	A2	20000126	EP 1999-305781	19990721
EP 974571	A3	20000412		
EP 974571	B1	20030423		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
US 6124510	A	20000926	US 1998-119560	19980721
JP 2000063300	A2	20000229	JP 1999-204714	19990719
AT 238258	E	20030515	AT 1999-305781	19990721
PT 974571	T	20030731	PT 1999-305781	19990721
ES 2195520	T3	20031201	ES 1999-305781	19990721
PRIORITY APPLN. INFO.:			US 1998-119560	A 19980721

AB Mixts. of cis- and trans-1,1,1,3-tetrafluoro-2-propene are prepared in high yield and selectivity by: (A) contacting 1,1,1,3,3-pentafluoropropane with an alkaline solution, preferably an aqueous or alc. solution of a base such as KOH, NaOH, Ca(OH)<sub>2</sub> or Mg(OH)<sub>2</sub>, or with a chromium-based catalyst, such



as fluorided Cr<sub>2</sub>O<sub>3</sub> or fluorided Cr/Ni/AlF<sub>3</sub>; and (B) recovering the cis/trans-1,1,1,3-tetrafluoro-2-propene isomer mixture from the reaction mixture

IT 1645-83-6P, 1,1,1,3-

Tetrafluoro-2-propene 29118-24-9P,

trans-1,3,3,3-

Tetrafluoropropene 29118-25-0P, 1-Propene,

1,3,3,3-tetrafluoro-,

(1Z) -

RL: IMF (Industrial manufacture); PREP (Preparation)

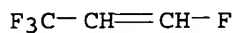
(dehydrofluorination process and catalysts for the preparation of

1,1,1,3-tetrafluoropropenes from 1,1,1,

3,3-pentafluoropropane)

RN 1645-83-6 HCAPLUS

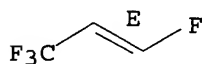
CN 1-Propene, 1,3,3,3-tetrafluoro- (9CI) (CA INDEX NAME)



RN 29118-24-9 HCAPLUS

CN 1-Propene, 1,3,3,3-tetrafluoro-, (1E)- (9CI) (CA INDEX NAME)

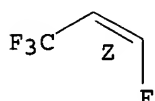
Double bond geometry as shown.



RN 29118-25-0 HCAPLUS

CN 1-Propene, 1,3,3,3-tetrafluoro-, (1Z)- (9CI) (CA INDEX NAME)

Double bond geometry as shown.



IT 460-73-1, 1,1,1,3,

3-Pentafluoropropane 1305-62-0,

Calcium hydroxide, reactions 1310-58-3,

Potassium hydroxide, reactions 1310-73-2,

Sodium hydroxide, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

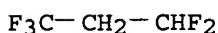
(dehydrofluorination process and catalysts for the preparation of

1,1,1,3-tetrafluoropropenes from 1,1,1,

3,3-pentafluoropropane)

RN 460-73-1 HCAPLUS

CN Propane, 1,1,1,3,3-pentafluoro- (6CI, 8CI, 9CI) (CA INDEX NAME)



RN 1305-62-0 HCAPLUS

CN Calcium hydroxide (Ca(OH)<sub>2</sub>) (9CI) (CA INDEX NAME)

HO-Ca-OH

RN 1310-58-3 HCAPLUS  
 CN Potassium hydroxide (K(OH)) (9CI) (CA INDEX NAME)

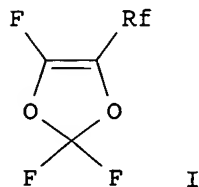
K-OH

RN 1310-73-2 HCAPLUS  
 CN Sodium hydroxide (Na(OH)) (9CI) (CA INDEX NAME)

Na-OH

L32 ANSWER 3 OF 11 HCAPLUS COPYRIGHT 2005 ACS on STN  
 ACCESSION NUMBER: 1999:557721 HCAPLUS  
 DOCUMENT NUMBER: 131:170741  
 TITLE: New perfluorodioxoles, their preparation and their copolymers  
 INVENTOR(S): Russo, Antonio; Navarrini, Walter  
 PATENT ASSIGNEE(S): Ausimont S.p.A., Italy  
 SOURCE: Eur. Pat. Appl., 16 pp.  
 CODEN: EPXXDW  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

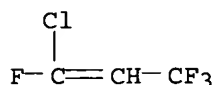
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 937720	A1	19990825	EP 1999-101399	19990126
EP 937720	B1	20020619		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
IT 1298257	B1	19991220	IT 1998-MI291	19980217
US 6335408	B1	20020101	US 1999-249853	19990216
US 6469185	B1	20021022	US 2001-880863	20010615
US 2002183471	A1	20021205		
PRIORITY APPLN. INFO.:			IT 1998-MI291	A 19980217
			US 1999-249853	A3 19990216
OTHER SOURCE(S):		MARPAT 131:170741		
GI				



AB Perfluoro-4-alkyl-1,3-dioxoles having the general formula I (Rf = C1-5

perfluoroalkyl) allow preparation of copolymers with Tg higher than those of copolymers containing the same molar percentage of the usual fluorinated dioxoles. Thus, reaction of CH<sub>2</sub>:CF<sub>2</sub> with CF<sub>2</sub>BrCl at 110°/20 atm in the presence of tert-Bu<sub>2</sub>O<sub>2</sub> gave 62% BrCF<sub>2</sub>CH<sub>2</sub>CF<sub>2</sub>Cl, which was dehydrobrominated with KOH and isomerized with AlCl<sub>3</sub> to CF<sub>3</sub>CH:CFCl (mixture of cis and trans isomers); the CF<sub>3</sub>CH:CFCl underwent cyclization with CF<sub>2</sub>(OF)<sub>2</sub> and the product was dehydrochlorinated to I (Rf = CF<sub>3</sub>) (II). A 30:70 II-C<sub>2</sub>F<sub>4</sub> copolymer showed Tg 92° and 10% weight loss at 495°.

IT 460-71-9P, 1-Chloro-1,3,  
3,3-tetrafluoro-1-propene  
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT  
(Reactant or reagent)  
(preparation of perfluorinated alkyldioxoles and their copolymers)  
RN 460-71-9 HCAPLUS  
CN 1-Propene, 1-chloro-1,3,3,3-tetrafluoro- (9CI) (CA INDEX NAME)



REFERENCE COUNT: 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L32 ANSWER 4 OF 11 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1961:27441 HCAPLUS

DOCUMENT NUMBER: 55:27441

ORIGINAL REFERENCE NO.: 55:5323g-i,5324a-d

TITLE: Substitution and addition reactions of the  
fluoroolefins. IV. Reactions of fluoride ion with  
fluoroolefins

AUTHOR(S): Miller, William T., Jr.; Fried, John H.; Goldwhite,  
Harold

CORPORATE SOURCE: Cornell Univ., Ithaca, NY

SOURCE: Journal of the American Chemical Society (1960), 82,  
3091-9

CODEN: JACSAT; ISSN: 0002-7863

DOCUMENT TYPE: Journal

LANGUAGE: Unavailable

OTHER SOURCE(S): CASREACT 55:27441

AB cf. CA 54, 8592b. Fluoride ion reacts readily with fluoroolefins by 3 paths: (1) substitution of vinyl halogen, (2) substitution of allyl halogen with rearrangement, and (3) addition to form a fluorocarbanion. An example of (1) is the reaction of 1,2-dichlorotetrafluoropropene with KF-HCONH<sub>2</sub> to give 55% 2-chloro-1,1,1,3,3,3-hexafluoropropane. Examples of (2) are the reactions of 3,3-dichloro-1,1,3-trifluoropropene with KF-HCONH<sub>2</sub> to give 90% 1-chloro-1,3,3,3-tetrafluoropropene and with Et<sub>4</sub>NF in CHCl<sub>3</sub> to give 74% 1-chloro-1,3,3,3-tetrafluoropropene, 1,3-dichloro-1,2,3,3-tetrafluoropropene with KF-HCONH<sub>2</sub> at 60° to give 52% 1,1,1,2,3,3,3-heptafluoropropene, 2,3-dichloro-1,1,3,3-tetrafluoropropene with Et<sub>4</sub>NF in CHCl<sub>3</sub> at 0° to give 52% 2-chloropentafluoropropene in 5 min., and the F ion catalyzed rearrangement of perfluoro-1-heptene to give isomeric olefins. Preferential substitution of allyl, rather than vinyl, halogen is shown by the reaction of 1,4-dibromohexafluoro-2-butene with excess F ion at 60° to give octafluoro-2-butene and its HF addition product. Examples of (3) are the reactions of KF-HCONH<sub>2</sub> with

chlorotrifluoroethylene to give 72% chlorotetrafluoroethane, with perfluoropropene at 25° to give 60% 1,1,1,2,3,3,3-heptafluoropropane, with perfluoropropene at 65° to give 21% 1,1,1,2,3,3,3-heptafluoropropane, with 2-chloro-1,1,3,3,3-pentafluoropropene at 25° to give 61% 2-chloro-1,1,1,3,3,3-hexafluoropropane, and with perfluoro-2-butene at 81° to give 35% 1,1,1,2,2,3,4,4,4-nonafluorobutane. CCl<sub>2</sub>FI (209 g.) is charged into a steel lecture cylinder fitted with a steel valve, which is cooled with dry ice, and 60 g. CH<sub>2</sub>:CF<sub>2</sub> condensed into it at 2.5 atmospheric. The cylinder is sealed and heated to 125 ± 5° 19 hrs., then cooled, and vented to yield 12 g. unreacted olefin and by distillation CCl<sub>2</sub>FCH<sub>2</sub>CF<sub>2</sub>I (295 g. from 2 runs), b<sub>13</sub> 39°, n<sub>20D</sub> 1.4655, d. 2.0978. In the same equipment 316 g. CCl<sub>3</sub>I and 65 g. CH<sub>2</sub>:CF<sub>2</sub> at 115 ± 5° 36 hrs. give 2 g. olefin and 264 g. CCl<sub>3</sub>CH<sub>2</sub>CF<sub>2</sub>I, b<sub>29</sub> 83-4°, b<sub>22</sub> 78.3-8.5°, f.p. -37.5°, n<sub>20D</sub> 1.5089, d. 2.1157, MRD 43.67, λ<sub>maximum</sub> 270 mμ (ε 379), λ<sub>min.</sub> 234 mμ (ε 87) (0.67 g./l., iso-octane), coupled by Zn in Et<sub>2</sub>O to give 88% C<sub>6</sub>H<sub>4</sub>Cl<sub>6</sub>F<sub>4</sub>, chlorinated to give C<sub>6</sub>Cl<sub>10</sub>F<sub>4</sub>, presumably CCl<sub>3</sub>CCl<sub>2</sub>CF<sub>2</sub>CF<sub>2</sub>-CCl<sub>2</sub>CCl<sub>3</sub>, m. 116.7-18.0°. CCl<sub>3</sub>CH<sub>2</sub>CF<sub>2</sub>I (155 g.) in 400 ml. peroxide-free diethylene glycol di-Et ether is dehydrohalogenated by 57 g. KOH in 70 ml. H<sub>2</sub>O under N at 150° to give 28.5 g. CCl<sub>2</sub>:CHCClF<sub>2</sub>, redistd. through a 100 cm. spinning band column, b<sub>749</sub> 95.5°, f.p. -96.5°, n<sub>20D</sub> 1.4290, d. 1.5208, MRD 30.8. Photochem. chlorination at atmospheric pressure of 16.1

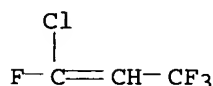
g.

CCl<sub>2</sub>:CHCClF<sub>2</sub> gives 16.0 g. CCl<sub>3</sub>CHCl-CClF<sub>2</sub>, b<sub>746</sub> 168-9°, n<sub>20D</sub> 1.4610, d. 1.725, MRD 40.2. CCl<sub>2</sub>:CHCClF<sub>2</sub> (2 g.) is chlorinated with 3 g. Cl in the presence of 2.5 g. H<sub>2</sub>O to give 3.05 g. CCl<sub>3</sub>CCl<sub>2</sub>CClF<sub>2</sub>, m. 51.0-1.2°. Pyrolysis of chlorotrifluoroethylene gives a dichlorotetrafluoropropene fraction, b. 44-9°, which is photochem. brominated, debrominated with Zn in dioxane, treated with LiCl in Me<sub>2</sub>CO, and then with excess NaI in Me<sub>2</sub>CO to give CClF:CFCClF<sub>2</sub>, b<sub>733</sub> 47.0-8.0°, b. 47.5°, n<sub>20D</sub> 1.3527, d. 1.5335. CClF<sub>2</sub>CF:CFCClF<sub>2</sub> (1 mole) is fluorinated by heating with 2 moles HgO and 4.5 moles HF at 110° 4 hrs. in a steel bomb to give 73% octafluoro-2-butene.

IT 460-71-9, Propene, 1-chloro-  
1,3,3,3-tetrafluoro-  
(preparation of)

RN 460-71-9 HCAPLUS

CN 1-Propene, 1-chloro-1,3,3,3-tetrafluoro- (9CI) (CA INDEX NAME)



L32 ANSWER 5 OF 11 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1961:2127 HCAPLUS

DOCUMENT NUMBER: 55:2127

ORIGINAL REFERENCE NO.: 55:349c-g

TITLE: Reactions of fluoro olefins. XIII. Catalytic hydrogenation of perfluoro olefins

AUTHOR(S): Knunyants, I. L.; Krasuskaya, M. P.; Mysov, E. I.

CORPORATE SOURCE: Inst. Heteroorg. Compds., Moscow

SOURCE: Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya (1960) 1412-18

CODEN: IASKA6; ISSN: 0002-3353

DOCUMENT TYPE: Journal

LANGUAGE: Unavailable

AB cf. CA 53, 1102b; 54, 20871c. Hydrogenation of C<sub>2</sub>F<sub>4</sub> over reduced Ni catalyst at 158° in a flow system gave 66% C<sub>2</sub>H<sub>2</sub>F<sub>4</sub> and 14% C<sub>2</sub>H<sub>3</sub>F<sub>3</sub>; over 1% Pd-Al<sub>2</sub>O<sub>3</sub> at 90° there was formed 97.3% CHF<sub>2</sub>CHF<sub>2</sub>. Hydrogenation (over Pd-Al<sub>2</sub>O<sub>3</sub>) of CF<sub>2</sub>:CFCl at room temperature gave 75.5% mixed (CHF<sub>2</sub>)<sub>2</sub> and CF<sub>2</sub>:CHF. CF<sub>3</sub>CF:CF<sub>2</sub> over Pd-Al<sub>2</sub>O<sub>3</sub> at 50° gave 96% 1,1,2,3,3,3-hexafluoropropane, b. 4-5°. (CF<sub>3</sub>)<sub>2</sub>C:CF<sub>2</sub> similarly gave at 60° 85% 1,1,3,3,3-pentafluoro-2-trifluoromethylpropane (I), b. 33-4°, d<sub>20</sub> 1.558; reaction over Ni at 130° gave 10% of this product and 70% 3,3,3-trifluoro-2-trifluoromethylpropane, b. 21°. I warmed with 30% aqueous KOH gave 76% 1,3,3,3-tetrafluoro-2-trifluoromethyl-1-propene (II), b. 17-8°, which with KMnO<sub>4</sub> gave (CF<sub>3</sub>)<sub>2</sub>CO. Hydrogenation of II over Pd-Al<sub>2</sub>O<sub>3</sub> at room temperature gave the saturated analog, 80%, b. 39-40°, which with powdered KOH in Bu<sub>2</sub>O at 50° gave 70% 3,3,3-trifluoro-2-trifluoromethyl-1-propene, b. 13-4°, while the use of 90% KOH at 170° gave 54% 1,1,3,3,3-pentafluoro-2-methyl-1-propene, b. 12-3°. Reaction of 1,1,2,3,3,3-hexafluoropropane with powdered KOH in Bu<sub>2</sub>O with ice cooling gave 60% 1,2,3,3,3-pentafluoro-1-propene, b. -20° which hydrogenated over Pd-Al<sub>2</sub>O<sub>3</sub> at room temperature to 60% saturated analog (III), b. 20°, and 30% 2,3,3,3-tetrafluoropropane, b. -1°. III and KOH in Bu<sub>2</sub>O gave 70% 2,3,3,3-tetrafluoro-1-propene, b. -28°. Hydrogenation of 1,1,3,3,3-pentafluoro-1-propene over Pd-Al<sub>2</sub>O<sub>3</sub> at room temperature gave 70% saturated analog, b. 12°, while treatment of the former with KOH in Bu<sub>2</sub>O gave 70% 1,3,3,3-tetrafluoro-1-propene, b. -16°. Hydrogenation of perfluorobutadiene over Pd-Al<sub>2</sub>O<sub>3</sub> at room temperature gave 66% 1,1,2,3,4,4-hexafluorobutane, b. 63-5°, n<sub>20D</sub> 1.2985, which heated with powdered KOH 1.5 hrs. gave 85% 1,1,2,4,4-pentafluoro-2-butene, b. 56°, n<sub>20D</sub> 1.306 (which with KMnO<sub>4</sub> gave CHF<sub>2</sub>CO<sub>2</sub>H); bromination of this olefin gave 45% dibromide, m. 146-8°.

IT 460-73-1, Propane, 1,1,1,3,3-pentafluoro- 1645-83-6, Propene, 1,3,3,3-tetrafluoro- (preparation of)

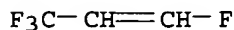
RN 460-73-1 HCAPLUS

CN Propane, 1,1,1,3,3-pentafluoro- (6CI, 8CI, 9CI) (CA INDEX NAME)



RN 1645-83-6 HCAPLUS

CN 1-Propene, 1,3,3,3-tetrafluoro- (9CI) (CA INDEX NAME)



L32 ANSWER 6 OF 11 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1960:44037 HCAPLUS

DOCUMENT NUMBER: 54:44037

ORIGINAL REFERENCE NO.: 54:8592b-e

TITLE: Substitution and addition reactions of the fluoroolefins. III. SN<sub>2</sub>' substitution reactions of chlorofluoroallyl chlorides with halide ions

AUTHOR(S): Fried, John H.; Miller, William T., Jr.  
 CORPORATE SOURCE: Cornell Univ., Ithaca, NY  
 SOURCE: Journal of the American Chemical Society (1959), 81,  
 2078-82  
 CODEN: JACSAT; ISSN: 0002-7863

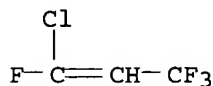
DOCUMENT TYPE: Journal  
 LANGUAGE: Unavailable

AB cf. C.A. 52, 1049b. The synthesis of 3,3-dichloro-1,1,3-trifluoropropene (I) and 3,3-dichloro-tetrafluoropropene (II) is reported. These compds. undergo substitution reactions with F-, Cl-, and I-. Since the products are rearranged it is known that an SN2' type reaction occurred. The order or reactivity is opposite to that normally encountered in nucleophile substitution. FCl<sub>2</sub>CCH<sub>2</sub>CF<sub>2</sub>I was prepared from 0.56 mole CCl<sub>2</sub>FI, 2.8 g. Bz<sub>2</sub>O<sub>2</sub>, and 0.56 mole CH<sub>2</sub>:CF<sub>2</sub>. The reaction was conducted at 85° for 15 hrs. in a steel cylinder. The product was isolated by distillation, b. 148°, m. 63.0°, n<sub>20D</sub> 1.4658, d<sub>20</sub> 2.0956, and dehydrohalogenated at 120° by adding 0.4 mole to 2.23 moles anhydrous powdered KOH over a 5-hr. period to give 78% I, b<sub>741</sub> 52.0-52.2°, m. -103.2°, n<sub>20D</sub> 1.3702, d<sub>20</sub> 1.4504. The other product of the reaction was 1-chloro-1,3,3-trifluoro-3-iodopropane, b<sub>70</sub> 41°, n<sub>20D</sub> 1.4680, d<sub>20</sub> 2.0884. II was prepared similarly from 1,1-dichloro-1,2,3,3-tetrafluoro-3-iodopropane and KOH, b<sub>735</sub> 46°, n<sub>20D</sub> 1.3556, d<sub>20</sub> 1.5378. I and II reacted with KF in formamide to give CF<sub>3</sub>CH:CClF and CF<sub>3</sub>CF:CClF, resp. Similarly, LiCl and NaI in acetone reacted with I to give the rearranged products, CClF<sub>2</sub>CH:CClF, b<sub>734</sub> 56-8°, n<sub>20D</sub> 1.3701, d<sub>20</sub> 1.459, and CF<sub>2</sub>ICH:CClF, b<sub>100</sub> 51°, n<sub>20D</sub> 1.4681, d<sub>20</sub> 2.0894.

IT 460-71-9, Propene, 1-chloro-  
 1,3,3,3-tetrafluoro-  
 (preparation of)

RN 460-71-9 HCAPLUS

CN 1-Propene, 1-chloro-1,3,3,3-tetrafluoro- (9CI) (CA INDEX NAME)



L32 ANSWER 7 OF 11 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1954:32422 HCAPLUS

DOCUMENT NUMBER: 48:32422

ORIGINAL REFERENCE NO.: 48:5786h-i,5787a-h

TITLE: The addition of free radicals to unsaturated systems.  
 II. Radical addition of olefins of the type RCH:CH<sub>2</sub>

AUTHOR(S): Haszeldine, R. N.; Steele, B. R.

CORPORATE SOURCE: Univ. Chem. Lab., Cambridge, UK

SOURCE: Journal of the Chemical Society, Abstracts (1953)  
 1199-1206

CODEN: JCSAAZ; ISSN: 0590-9791

DOCUMENT TYPE: Journal

LANGUAGE: Unavailable

AB cf. C.A. 46, 2477f; 47, 1032g. The formation of CF<sub>3</sub>CH<sub>2</sub>CHIR and not CF<sub>3</sub>CH<sub>2</sub>CH<sub>2</sub>I by addition of CF<sub>3</sub>I (I) to RCH:CH<sub>2</sub> [R = Me (II), Cl (III), F (IV), CO<sub>2</sub>Me (V), CF<sub>3</sub> (VI), or CN (VII)] shows that orientation in radical addition reactions does not depend on the polarization of the double bond but on other factors such as radical stability. Reaction vessels (30- or 300-ml. Pyrex or 50-ml. silica) were placed 10 cm. from a Hanovia ultraviolet lamp used without the Woods filter. I (24.7 g.) and 5.3 g. II kept in the dark

14 days gave no reaction, but after 14 days in ultraviolet light (with the liquid protected from the light to prevent reaction in the liquid phase or photolysis of the products) fractionation gave 14.6 g. mixture of equal amts. of I and II, liquid products which, shaken with Hg and redistd., yielded 14.9 g. MeCHICH<sub>2</sub>CF<sub>3</sub> (VIII), b<sub>763</sub> 103.5°, n<sub>20D</sub> 1.4277, and 0.94 g. fraction which, treated 4 days in a Carius tube, gave MeCHBrCH<sub>2</sub>Br and CHF<sub>3</sub>. VIII (1.7 g.) treated with 30 ml. 10% alc. KOH gave no reaction when stirred 2 hrs. in ice, but yielded 0.61 g. MeCH:CHCF<sub>3</sub>, b. 20°, when heated 4 hrs. at 80°. VIII (1.68 g.) and 0.55 g. Cl exposed to sunlight 2 hrs., then to ultraviolet light 1 hr., and shaken with Hg, gave 0.97 g. MeCHClCH<sub>2</sub>CF<sub>3</sub>, b. 64.5-6.0°, n<sub>20D</sub> 1.3438. VIII (1.37 g.) refluxed 4 hrs. with 4 g. Zn dust and 30 ml. dilute HCl gave 0.46 g. PrCF<sub>3</sub>, b. 18°. I (25.5 g.) and 8.2 g. III (no reaction after 15 days in the dark at room temperature) kept 14 days under ultraviolet light gave 16.6 g. mixture of equal amts. of I and III and 16.8 g. CHClCH<sub>2</sub>CF<sub>3</sub> (IX), b. 120°, n<sub>20D</sub> 1.453. I (7 g.) and 2.3 g. III kept 4 days with only the liquid phase exposed to ultraviolet light gave 3.5 g. recovered I and III, 4.4 g. IX, and 0.8 g. fraction b. 45-90°. I (37.9 g.) and 14.8 g. III heated 4 days at 230-5° in a 300-ml. autoclave gave 3.5 g. HCl, a mixture of 22.4 g. I and 1.7 g. III, 4.5 g. mixture, b. 45-50°, n<sub>20D</sub> 1.352 [refractionation CH<sub>2</sub>ClCH<sub>2</sub>CF<sub>3</sub>, b<sub>773</sub> 45.8-6.4°, n<sub>20D</sub> 1.339, 2 g. of which treated 4 hrs. at 20-40° with 40 ml. 10% alc. KOH, yielded 1.04 g. CH<sub>2</sub>:CHCF<sub>3</sub> (X)], 3.4 g. mixture, b. 50-110°, n<sub>20D</sub> 1.409, and 1.3 g. mixture, b. 110-20°, n<sub>20D</sub> 1.432, which was mainly IX. CH<sub>2</sub>ICH<sub>2</sub>CF<sub>3</sub> (1.5 g.) with a slight excess of Br or Cl exposed to ultraviolet light gave 80-90% CH<sub>2</sub>BrCH<sub>2</sub>CF<sub>3</sub> or Cl analog. IX (1.16 g.) and 0.353 g. Cl kept 12 hrs. in the dark at room temperature gave 0.59 g. CHCl<sub>2</sub>CH<sub>2</sub>CF<sub>3</sub>, b<sub>766</sub> 72.8-3.4°, n<sub>20D</sub> 1.363. X (1 g.) and 0.75 g. Cl gave 1.45 g. CH<sub>2</sub>ClCHClCF<sub>3</sub>, b. 76.6-7.2°, n<sub>20D</sub> 1.367. IX (1.8 g.) treated 2 hrs. with 40 ml. 10% alc. KOH gave 0.74 g. CHCl:CHCF<sub>3</sub>, b. 20.8°. IX (1.3 g.) treated 4 hrs. at about 80° with 4 g. Zn and 25 ml. dilute HCl gave a mixture containing 0.225 g. CH<sub>2</sub>ClCH<sub>2</sub>CF<sub>3</sub> and 0.065

g.

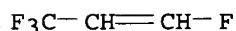
EtCF<sub>3</sub>, which could not be separated by distillation, and 0.105 g. EtCF<sub>3</sub>, b. -13°. IX (1.14 g.) refluxed 6 hrs. with 4.07 g. Zn and 30 ml. EtOH gave 0.22 g. EtCF<sub>3</sub> and no X. I (17.4 g.) and 4.07 g. IV irradiated 14 days gave 5 g. mixture of equal amts. I and IV, 13.9 g. CHIFCH<sub>2</sub>CF<sub>3</sub> (XI), b<sub>757</sub> 86.2°, n<sub>20D</sub> 1.4024, and 1.5 g. CHIFCH<sub>2</sub>CHFCH<sub>2</sub>CF<sub>3</sub>, b<sub>20</sub> 64°, n<sub>20D</sub> 1.421. XI (1.9 g.) kept 4 hrs. at 70° with 4 g. Zn and 30 ml. dilute HCl gave 0.72 g. CH<sub>2</sub>FCH<sub>2</sub>CF<sub>3</sub> (XII), b<sub>761</sub> 29.4°, b<sub>590</sub> 23°. XI (2.5 g.) heated 4 hrs. at 60° with 15 ml. 10% alc. KOH gave 0.94 g. CHF:CHCF<sub>3</sub>, b. -16°. CH<sub>2</sub>ICH<sub>2</sub>CF<sub>3</sub> (2 g.) added to 5 g. HgF (dried at 110°) and the mixture refluxed 5 hrs. at 120° gave 0.42 g. XII. XII (0.28 g.) shaken 24 hrs. at 20° with 3 ml. 10% alc. KOH gave 0.219 g. X. I (7.2 g.) and 2 g. V (no reaction in the dark) irradiated 4 days (8 cm. from the ultraviolet source) gave 5.2 g. I, 1.0 g. V, and 2.6 g. CF<sub>3</sub>CH<sub>2</sub>CHICO<sub>2</sub>Me (XIII), b<sub>42</sub> 82°, n<sub>20D</sub> 1.440, which liberates iodine on exposure to light. I (17.9 g.) and 8.38 g. V irradiated 6 days gave XIII and 6 g. polymers (a), b<sub>3</sub> 112°, n<sub>20D</sub> 1.447 (C 31.5, H 3.1%), and (b), b<sub>0.1</sub> 138 ± 2°, n<sub>20D</sub> 1.443 (C 39.0, H 4.2%) {calculated for CF<sub>3</sub>[CH<sub>2</sub>CH(CO<sub>2</sub>Me)]<sub>n</sub>I, n = 1, C 21.3, H 2.1%; n = 2, C 29.4, H 3.3%; n = 3, C 34.4, H 4.0%; n = 4, C 37.8, H 4.4%; calculated for (CF<sub>3</sub>CH<sub>2</sub>CHCO<sub>2</sub>Me)<sub>2</sub>, C 38.7, H 3.9%}. XIII (0.65 g.) refluxed with 2 g. Zn and 50% H<sub>2</sub>SO<sub>4</sub> gave 0.32 g. CF<sub>3</sub>CH<sub>2</sub>CH<sub>2</sub>CO<sub>2</sub>H, b<sub>12</sub> 70°. Ultraviolet maximum and min. (with e) are given for many compds.; infrared spectra are analyzed. The nature of the reaction is discussed.

IT

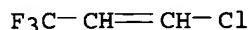
1645-83-6, Propene, 1,3,3,  
3-tetrafluoro- 2730-43-0, Propene,

1-chloro-3,3,3-  
trifluoro-  
(preparation of)

RN 1645-83-6 HCAPLUS  
CN 1-Propene, 1,3,3,3-tetrafluoro- (9CI) (CA INDEX NAME)



RN 2730-43-0 HCAPLUS  
CN 1-Propene, 1-chloro-3,3,3-trifluoro- (9CI) (CA INDEX NAME)



L32 ANSWER 8 OF 11 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1953:41096 HCAPLUS  
DOCUMENT NUMBER: 47:41096  
ORIGINAL REFERENCE NO.: 47:6858i,6859a-g  
TITLE: Reactions of fluorocarbon radicals. VII. Addition to  
trifluoromethyl-substituted acetylene  
AUTHOR(S): Haszeldine, R. N.  
CORPORATE SOURCE: Univ. Cambridge, UK  
SOURCE: Journal of the Chemical Society, Abstracts (1952)  
3490-8  
CODEN: JCSAAZ; ISSN: 0590-9791

DOCUMENT TYPE: Journal  
LANGUAGE: Unavailable  
OTHER SOURCE(S): CASREACT 47:41096

AB F3CC.tplbond.CH (I) (0.94 g.) and 10 ml. HF, kept 48 hrs. at room temperature  
and

heated 4 hrs. at 60°, give 92% 1,3,3,  
3-tetrafluoropropene, b. -16°. I (0.94 g.) and  
0.38 g. dry HCl, kept 2 hrs. at room temperature, give 100% F3CCH:CHCl, b.  
21°. I and dry HBr, 2 hrs. at 0°, give 100% F3CCH:CHBr  
(II), b. 40°; the reaction with AlBr3 at -25° gives 91% II.  
I (0.94 g.) and 1.38 g. dry HI at 100° give 65% F3CCH:CHI (III), b.  
70-1°; in the presence of 0.25 g. AlI3 (24 hrs. at room temperature), the  
products are 17% I, 19% HI, and 80% III; 100% excess HI at 100° in  
the presence of AlI3 gives 20% III and 8% F3CCH:CH2. I (0.94 g.), 0.81 g.  
anhydrous HCN, 0.1 g. KCN, 0.2 g. KCl, 0.8 g. CuCl, and 10 ml. H2O, heated 24  
hrs. at 100°, give 48% unchanged I (36% after 36 hrs. at  
120°); the combined liquid phases, heated at 80° with excess  
10% NaOH, acidified with H2SO4, and continuously extracted (24 hrs.)  
with ether, give 62% γ,γ,γ-trifluorocrotonic acid (IV),  
m. 51°. The Na salt (0.4 g.) of IV, 2 g. H3BO3, and 15 ml.  
(CH2OH)2, heated 4 hrs. at 150-200°, gives 41% F3CCH:CH2; 123 g. of  
the Ag salt and 3 g. powdered iodine, heated at about 10 mm., give 76% III.  
IV was prepared in 72% yield from 0.53 g. CH2:CHCN and 8.5 g.  
trifluoroiodomethane (irradiated 48 hrs. with ultraviolet light) and the  
4,4,4-trifluoro-2-iodobutyronitrile (not isolated pure) heated with 10%  
EtOH-KOH 1 hr. at 50°. I and anhydrous HBr do not react  
after 36 hrs. in the dark at -60°; irradiation with a Hanovia  
ultraviolet light at -60° gives exclusively II. I (1.88 g.) and 25  
ml. MeOH containing 0.5 g. Na, kept 3 hrs. at -20°, give 92%  
3,3,3-trifluoro-1-methoxypropene (V), b. 83-4°; EtO homolog (VI),  
b. 103°, nD25 1.349, 91%; 2 oxidations with alkaline KMnO4 gives 58 and



62% F<sub>3</sub>CCO<sub>2</sub>H. Hydrogenation of V over Raney Ni (1 hr. at 10-15°) gives 80% CH<sub>4</sub> and 79% F<sub>3</sub>CCH<sub>2</sub>CHO (VII); VI gives 78% C<sub>2</sub>H<sub>6</sub> and 74% VII; no evidence of the formation of F<sub>3</sub>Cac was obtained. There was no indication of the addition of 2 moles EtOH to I at 0° in the presence of EtONa (after 7 days). VI (1.7 g.) and 26 ml. EtOH containing 4 g. EtONa, heated 1.5 hrs. at 80° and the product hydrolyzed with H<sub>2</sub>SO<sub>4</sub>, give 28% F<sub>3</sub>CCH<sub>2</sub>CHO. I (0.94 g.), 0.02 g. CuCl, and 3 ml. Et<sub>2</sub>NH, kept 4 hrs. at room temperature and slowly heated to 100°, give 0.11 g. unchanged I and 28% 1-diethylamino-3,3,3-trifluoropropene, b<sub>105</sub> 40°. (F<sub>3</sub>CC.tplbond.)<sub>2</sub> (VIII) (0.81 g.) and 20% excess HCl in a tube containing 0.1 g. AlCl<sub>3</sub>, kept 3 hrs. at room temperature and 30 min. at 50°, give 65% F<sub>3</sub>CCH:CClCF<sub>3</sub>, b. 34-5°; this was also obtained with 200% excess HCl; with 20% excess HCl in the absence of AlCl<sub>3</sub>, the yield is 78% (24 hrs. at 100°). VIII and HBr (7 days in the dark at 30°) give 68% F<sub>3</sub>CCH:CB<sub>2</sub>CF<sub>3</sub> (IX); under the influence of ultraviolet light (2 hrs.), there results 87% IX and about 5% F<sub>3</sub>CCBr:CB<sub>2</sub>CF<sub>3</sub>. VIII (1.51 g.) and 15 ml. MeOH containing 0.75 g. Na, kept 48 hrs. at 0° and 1 hr. at 30°, give 61% 1,1,1,4,4,4-hexafluoro-2-methoxy-2-butene (X), b. 55-7°; 2-EtO Homolog (XI), b. 72.5-3°, 57%. Oxidation with alkaline KMnO<sub>4</sub> gives F<sub>3</sub>CCO<sub>2</sub>H. X and Br give a quant. yield of 2,3-dibromo-1,1,1,4,4,4-hexafluoro-2-methoxybutane, b<sub>25</sub> 58-9°, n<sub>D</sub>20 1.408; 2-EtO homolog, b<sub>32</sub> 72-3°, n<sub>D</sub>20 1.409. XI (1.65 g.), 1 g. EtONa, and 10 ml. EtOH, heated 1 hr. at 70°, give 59% 2,2-diethoxy-1,1,1,4,4,4-hexafluorobutane (XII), b. 135°, n<sub>D</sub>20 1.342; 2,2-di-Me homolog (XIII), b<sub>100</sub> 50°, 53%. Catalytic reduction of X over Raney Ni (0.5 hr. at room temperature and 0.5 hr. at 120°) gives 58% F<sub>3</sub>CCH<sub>2</sub>COCF<sub>3</sub> (XIV); XIII, refluxed with 50% H<sub>2</sub>SO<sub>4</sub>, gives 48% XIV; hydrolysis of XI gives 53% XIV. 2-Diethylamino-1,1,1,4,4,4-hexafluoro-2-butene, b<sub>150</sub> 72-4°, b<sub>760</sub> 123°, n<sub>D</sub>20 1.371, 57%.

IT 1645-83-6, Propene, 1,3,3,  
3-tetrafluoro- 2730-43-0, Propene,  
1-chloro-3,3,3-  
trifluoro-  
(preparation of)  
RN 1645-83-6 HCAPLUS  
CN 1-Propene, 1,3,3,3-tetrafluoro- (9CI) (CA INDEX NAME)

F<sub>3</sub>C-CH=CH-F

RN 2730-43-0 HCAPLUS  
CN 1-Propene, 1-chloro-3,3,3-trifluoro- (9CI) (CA INDEX NAME)

F<sub>3</sub>C-CH=CH-Cl

L32 ANSWER 9 OF 11 HCAPLUS COPYRIGHT 2005 ACS on STN  
ACCESSION NUMBER: 1952:14342 HCAPLUS  
DOCUMENT NUMBER: 46:14342  
ORIGINAL REFERENCE NO.: 46:2484h-i,2485a-d  
TITLE: The preparation of hexafluoroacetone  
AUTHOR(S): Henne, Albert L.; Shepard, John W.; Young, Evan J.  
CORPORATE SOURCE: Ohio State Univ., Columbus  
SOURCE: Journal of the American Chemical Society (1950), 72,  
3577-9  
CODEN: JACSAT; ISSN: 0002-7863  
DOCUMENT TYPE: Journal

LANGUAGE: Unavailable  
 OTHER SOURCE(S): CASREACT 46:14342  
 AB Repeated chlorination of Me<sub>2</sub>C:CHCl, f.p. -78.7°, b. 158°, d<sub>420</sub> 1.3319, nD<sub>20</sub> 1.4980, and its chlorination products, CHCl<sub>2</sub>CMe:CH<sub>2</sub>, b. 105-28°, CH<sub>2</sub>ClCMe:CHCl, b. 128-35°, (CH<sub>2</sub>Cl)<sub>2</sub>C:CH<sub>2</sub>, b. 135-41°, and Me<sub>2</sub>CClCH<sub>2</sub>Cl, b. 141-7°, gives 43% CH<sub>2</sub>ClCMeClCHCl<sub>2</sub>, b<sub>20</sub> 78-85°. KOH in cold 1:1 MeOH-H<sub>2</sub>O gives the lachrymator CH<sub>2</sub>ClCMe:CCl<sub>2</sub>, which chlorinates to CH<sub>2</sub>ClCMeClCCl<sub>3</sub> (I), f.p. 58-63°, b<sub>10</sub> 98-102°, b<sub>760</sub> 205-10°. Removal of HCl gives CCl<sub>3</sub>CMe:CHCl, f.p. -70.0°, b. 174.8°, d<sub>420</sub> 1.4528, nD<sub>20</sub> 1.5129, easily hydrolyzed. With SbF<sub>3</sub> this gives 70% CF<sub>3</sub>CMe:CHCl (II), f.p. -120.3°, b. 46.4°, d<sub>420</sub> 1.2395, nD<sub>20</sub> 1.3489, A Rf 1.1. It is better to treat I with SbF<sub>3</sub> and Cl at 165° and 10-11 atmospheric to give 40% CF<sub>3</sub>CMeClCH<sub>2</sub>Cl (III), b. 93.5°, d<sub>420</sub> 1.3899, nD<sub>20</sub> 1.3782, ARf 1.0, together with a mixture of II and CF<sub>3</sub>C(CH<sub>2</sub>Cl):CH<sub>2</sub>, b. 64.1°, d<sub>420</sub> 1.2824, nD<sub>20</sub> 1.3520, ARf 0.9. A 2nd method of preparing III, more suitable for a small-scale synthesis, is from MeMgCl and CF<sub>3</sub>CO<sub>2</sub>Et to give 97% of the azeotropic mixture EtOHCF<sub>3</sub>C(OH)Me<sub>2</sub>, b. 75-81°, which over P<sub>2</sub>O<sub>5</sub> at 130° gives 97% CF<sub>3</sub>CMe:CH<sub>2</sub>, b. 6.7°. Chlorination in the dark in the presence of a little FeCl<sub>3</sub> at 0° gives III. III refluxed with alc. KOH gives II, which under the same conditions chlorinates to CF<sub>3</sub>CMeClCHCl<sub>2</sub>, b. 123.7°, d<sub>420</sub> 1.5201, nD<sub>20</sub> 1.4084, ARf 1.0. Removal of HCl gives CF<sub>3</sub>CMe:CCl<sub>2</sub> (IV), b. 88.4°, d<sub>420</sub> 1.4248, nD<sub>20</sub> 1.9947, ARf 1.1. SbF<sub>3</sub> and Cl with HF at 55-130° and 10-20 atmospheric react with IV mixed with the residues from previous runs of this reaction to give (CF<sub>3</sub>)<sub>2</sub>CHMe (V), f.p. -106.7°, b. 21.5°, d<sub>40</sub> 1.3725, nD<sub>2.9</sub> 1.2717, A Rf 1.1, and some CF<sub>3</sub>CHMeCF<sub>2</sub>Cl, b. about 55°, and CF<sub>3</sub>CHMeCFCl<sub>2</sub>, b. about 70°, which are retreated. Chlorination of V goes slowly in ultraviolet light to give (CF<sub>3</sub>)<sub>2</sub>CHCCl<sub>3</sub> (VI), b. 106.5-7.5°, d<sub>420</sub> 1.7095, nD<sub>20</sub> 1.3690, and [(CF<sub>3</sub>)<sub>2</sub>CHCCl<sub>2</sub>]<sub>2</sub>, m. 111.8-12.4°, which loses HCl to give [(CF<sub>3</sub>)<sub>2</sub>C:CCl]<sub>2</sub>, b. 123°, d<sub>420</sub> 1.6838, nD<sub>20</sub> 1.3462, A Rf 1.2. Removal of HCl from VI with KOH in EtOH or MeOH-H<sub>2</sub>O below 10° gives 50% (CF<sub>3</sub>)<sub>2</sub>C:CCl<sub>2</sub> (VII), f.p. -98.2°, b. 74.5°, d<sub>420</sub> 1.6429, nD<sub>20</sub> 1.3517, A Rf 1.2, and an unidentified compound, b. 127-30°, d<sub>420</sub> 1.4364, nD<sub>20</sub> 1.3696. In iso-PrOH only VII is formed. VI with KOH in H<sub>2</sub>O-(HOCH<sub>2</sub>CH<sub>2</sub>)<sub>2</sub>O gives 82.5% VII. VII with aqueous acid KMnO<sub>4</sub> gives the hydrate of (CF<sub>3</sub>)<sub>2</sub>CO, which with P<sub>2</sub>O<sub>5</sub> gives the free ketone, b. -26°, and an unidentified liquid whose semicarbazone m. 190°. Properties are reported for CClF<sub>2</sub>CMeClCH<sub>2</sub>Cl, b. 131-2°, d<sub>420</sub> 1.4441, nD<sub>20</sub> 1.4326, A Rf 0.9; CClF<sub>2</sub>CMe:CHCl, b. 86-7°, d<sub>420</sub> 1.3406, nD<sub>20</sub> 1.4023, A Rf 0.8; CF<sub>3</sub>CMeClCCl<sub>3</sub>, f.p. 115.6-16.4°, b. 148-9°; CF<sub>3</sub>CMeClCF<sub>2</sub>Cl, b. 75.3°, d<sub>420</sub> 1.5133, nD<sub>20</sub> 1.3440, A Rf 1.1; CF<sub>3</sub>CMe:CF<sub>2</sub>, b<sub>745</sub> 12.8-13.5°.

L32 ANSWER 10 OF 11 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1946:14644 HCAPLUS  
 DOCUMENT NUMBER: 40:14644  
 ORIGINAL REFERENCE NO.: 40:2780h-i,2781a-e  
 TITLE: Fluorinated derivatives of propane and propylene. VI  
 AUTHOR(S): Henne, Albert L.; Waalkes, T. Phillip  
 CORPORATE SOURCE: Ohio State Univ., Columbus  
 SOURCE: Journal of the American Chemical Society (1946), 68, 496-7  
 CODEN: JACSAT; ISSN: 0002-7863.  
 DOCUMENT TYPE: Journal  
 LANGUAGE: Unavailable

AB cf. C.A. 40, 829.8. CH<sub>2</sub>(CF<sub>3</sub>)<sub>2</sub> (I), f.p. -93.62°, b. -0.7°, was synthesized by the following reactions: MeCHClCHCl<sub>2</sub> with alkali gives

88% of MeCH:CCl<sub>2</sub>; heating with HF at 100°/20 atmospheric gives 60% of MeCH<sub>2</sub>CF<sub>2</sub>Cl (II) and 12% of MeCH<sub>2</sub>CFCl<sub>2</sub>. II and nascent HgF<sub>2</sub> give 90% of MeCH<sub>2</sub>CF<sub>3</sub>; chlorination yields CF<sub>3</sub>CH<sub>2</sub>CCl<sub>3</sub> which with HgF<sub>2</sub> gives 84% of I and 5% of CClF<sub>2</sub>CH<sub>2</sub>CF<sub>3</sub> (III), f.p. -107°, b. 28.4°, d<sub>420</sub> 1.4372, n<sub>D20</sub> 1.2875 (all d. and n under these conditions). III with alc. KOH gives 65%, of CF<sub>2</sub>:CHCF<sub>3</sub>, f.p. -153.11°, b. -21°; this does not add HF at temps. below 100° but above this temperature addition is rapid and quant. MeCH:CF<sub>2</sub>, f.p. -160.93°, b. 29°, is not a practical intermediate in the preparation of I. CHCl(CH<sub>2</sub>Cl)<sub>2</sub> with alkali gives 80% of CH<sub>2</sub>:CClCH<sub>2</sub>Cl; HF gives 70% of MeCFClCH<sub>2</sub>Cl (MeCF<sub>2</sub>CH<sub>2</sub>Cl as byproduct); direct chlorination yields MeCFClCCl<sub>3</sub> (IV), dehydrohalogenation of which failed because the hydrolysis of CH<sub>2</sub>:CXCCl<sub>3</sub> is much faster than its generation. Partial fluorination of IV gives a mixture of 10% MeCFClCFCl<sub>2</sub> (V), 35% MeCFClCF<sub>2</sub>Cl (VI) (f.p. -30.48°, b. 55.6°, d. 1.3956, n 1.3503), and 35% MeCF<sub>2</sub>CFCl<sub>2</sub>. VI with alkali gives slowly (3 days) CH<sub>2</sub>:CFCF<sub>2</sub>Cl, f.p. -143.7°, b. 11.9°; V with alkali at 50° gives 40% of CH<sub>2</sub>:CFCFCl<sub>2</sub>, f.p. -115.9°, b. 54.4°, d. 1.3523, n 1.3851; with SbCl<sub>3</sub> both give CH<sub>2</sub>:CFCF<sub>3</sub>, f.p. -152.24°, b. -28.3°. MeCFClCH<sub>2</sub>Cl is chlorinated in such a manner as to give a mixture of CHCl<sub>2</sub>CClFCCl<sub>3</sub> and CH<sub>2</sub>ClCClFCCl<sub>3</sub> with which alkali gives a mixture of CCl<sub>2</sub>:CFCCl<sub>3</sub>, f.p. -77°, b. 171.1°, d. 1.7064, n 1.5026, and CHCl:CFCCl<sub>3</sub>, b. 147.8°, d. 1.5877, n 1.4870. With SbF<sub>3</sub> these yield CHCl:CFCF<sub>3</sub>, f.p. -115.8°, b. 15°, and CCl<sub>2</sub>:CFCF<sub>3</sub>, f.p. -139.6°, b. 46.4°, d. 1.5389, n 1.3504, which give a quant. yield of CCl<sub>3</sub>CClFCF<sub>3</sub>; SbF<sub>3</sub>Cl<sub>2</sub> at 180° gives 60% of CF<sub>2</sub>ClCFClCF<sub>3</sub> (VII), f.p. -136°, b. 34.7°, d. 1.5896, n 1.3029, and 28% of CFCl<sub>2</sub>CFClCF<sub>3</sub>, b. 73.5°, d. 1.6643, n 1.3529. Zn treatment of VII in boiling EtOH is slow (3 days) but the reaction proceeds readily under pressure at 100°, giving CF<sub>2</sub>:CFCF<sub>3</sub>, f.p. -156.2°, b. -29.4°. CH<sub>2</sub>ClCH<sub>2</sub>CF<sub>3</sub> yields CH<sub>2</sub>:CHCF<sub>3</sub>, b. -19 to -17°. MeCFClCF<sub>2</sub>Cl with Zn, even at 200°, gives only a trace of MeCF:CF<sub>2</sub>. CCl<sub>3</sub>CCl<sub>2</sub>CF<sub>3</sub> with SbF<sub>3</sub> gives CFCl<sub>2</sub>CCl<sub>2</sub>CF<sub>3</sub> which with Zn gives CFCl:CClCF<sub>3</sub>, f.p. -137°, b. 47.3°, d. 1.5468, n 1.3511; PbO<sub>2</sub> and HF give CF<sub>2</sub>ClCFClCF<sub>3</sub>. CF<sub>2</sub>ClCCl<sub>2</sub>CF<sub>3</sub> with Zn gives CF<sub>2</sub>:CClCF<sub>3</sub> which yields CF<sub>3</sub>CFCFClCF<sub>3</sub>, b. -2°. HF can be added to MeCH:CF<sub>2</sub> and CF<sub>2</sub>:CHCF<sub>3</sub> but not to CHCl:CFCCl<sub>3</sub>, CH<sub>2</sub>:CFCFCl<sub>2</sub>, CH<sub>2</sub>:CFCF<sub>2</sub>Cl, or CH<sub>2</sub>:CFCF<sub>3</sub>. CFCl:CFCF<sub>3</sub>, f.p. -158°, b. 7.9°. CF<sub>3</sub>CCl<sub>2</sub>CCl<sub>2</sub>F m. 41.7°, b. 112.4°. These fluorinated derivs. of C<sub>3</sub>H<sub>8</sub> and C<sub>3</sub>H<sub>6</sub> were prepared for measurement of interat. distances.

L32 ANSWER 11 OF 11 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1942:26777 HCAPLUS

DOCUMENT NUMBER: 36:26777

ORIGINAL REFERENCE NO.: 36:4090h-i,4091a-e

TITLE: Preparation and directed chlorination of 1,1,1-trifluoropropane

AUTHOR(S): Henne, Albert L.; Whaley, Atherton M.

SOURCE: Journal of the American Chemical Society (1942), 64, 1157-9

CODEN: JACSAT; ISSN: 0002-7863

DOCUMENT TYPE: Journal

LANGUAGE: Unavailable

AB Boiling 10 moles of MeCH<sub>2</sub>CHCl<sub>2</sub> with Cl in the dark (Fe as catalyst) gives 6 moles of MeCHClCHCl<sub>2</sub> (b. 130-3°); 10 moles of this, refluxed and stirred with 15 moles of 20% aqueous NaOH, gives 9 moles of MeCH:CCl<sub>2</sub> (b. 75-7°); 10 moles with anhydrous HCl in presence of 2-3% AlCl<sub>3</sub> yields 4.5 moles of MeCHClCCl<sub>3</sub> (b. 106.5-8.5°). EtCCl<sub>3</sub> with SbF<sub>3</sub> in the presence of a catalyst gives only 5-10% EtCF<sub>3</sub> (I) and 10% of a mixture of EtCF<sub>2</sub>Cl (II), b. 25.8°, d<sub>48</sub> 1.1311, n<sub>D8</sub> 1.3330, and

EtCFCl<sub>2</sub>; without a catalyst practically no fluoride is formed but 50% of MeCH:CCl<sub>2</sub> were isolated. CH<sub>2</sub>:CHCCl<sub>3</sub> does not exchange halogens with SbF<sub>3</sub>. MeCH:CCl<sub>2</sub> (10 moles) and 25 moles of HF, heated at 75° for 5 hrs. and at 95° until the pressure is 20 atmospheric (the HCl being tapped off intermittently), the product poured into 1300 g. SbF<sub>3</sub> and 250 g. Cl, heated with a free flame and the product tapped off at 13 atmospheric, give 800 g. condensate, from which 3.6 moles each of I (b. -13°, m. -148°) and II were separated by low-temperature distillation Heating 10 moles

of

II with 1300 g. SbF<sub>3</sub> and 400 g. Cl and 10 moles HF at 95° gives 8.5 moles of I and 0.3 mole of II. The action of Cl upon I in sunlight in a glass container in the vapor phase and then in the liquid phase gives the following: ClCH<sub>2</sub>CH<sub>2</sub>CF<sub>3</sub>, b. 45.1°, m. -106.2°, d<sub>420</sub> 1.3253, n<sub>D20</sub> 1.3350; Cl<sub>2</sub>CHCH<sub>2</sub>CF<sub>3</sub>, b. 72.4°, m. -93.2°, d<sub>D20</sub> 1.4408, n<sub>D20</sub> 1.3631; Cl<sub>3</sub>CCH<sub>2</sub>CF<sub>3</sub>, b. 95.1°, m. -41.7°, d<sub>420</sub> 1.5511, n<sub>D20</sub> 1.3900; Cl<sub>3</sub>CCCl<sub>2</sub>CF<sub>3</sub>, b. 153.1, m. 109°; no evidence for a tetra-Cl derivative was found. Rechlorination of 116 g. of Cl<sub>2</sub>CHCH<sub>2</sub>CF<sub>3</sub> gives 132 g. Cl<sub>3</sub>CCH<sub>2</sub>CF<sub>3</sub>. MeCHClCCl<sub>3</sub> with HF and HgO at 100° gives 80% of MeCHClCF<sub>3</sub>, b. 30°, n<sub>D20</sub> 1.3150. Chlorination of 93 g. of MeCHClCF<sub>3</sub> gives 111 g. of product, 80% of which was dichlorides; 2/3 was MeCCl<sub>2</sub>CF<sub>3</sub>, b. 48.8°, m. 13.8°, d<sub>420</sub> 1.3842, n<sub>D20</sub> 1.3478, and the remainder was CH<sub>2</sub>ClCHClCF<sub>3</sub>, b. 76.7°, n<sub>D20</sub> 1.3671. CHCl<sub>2</sub>CH<sub>2</sub>CF<sub>3</sub> with alc. alkali yields CHCl:CHCF<sub>3</sub>, which with Cl gives Cl<sub>2</sub>CHCHClCF<sub>3</sub>, b. 106.8°. Cl<sub>3</sub>CCCl<sub>2</sub>CF<sub>3</sub> with SbCl<sub>2</sub>F<sub>3</sub> gives quant. Cl<sub>2</sub>CFCCl<sub>2</sub>CF<sub>3</sub>, b. 112.4°, m. 41.74°, and ClCF<sub>2</sub>CCl<sub>2</sub>CF<sub>3</sub>, b. 72°, m. -4.3°, d<sub>D20</sub> 1.6681, n<sub>D20</sub> 1.3519. Cl<sub>2</sub>C:CClCF<sub>3</sub>, b. 88.3°, m. -114.7°, d<sub>420</sub> 1.6188, n<sub>D20</sub> 1.4095. ClCH:CClCF<sub>3</sub>, b. 53.7°, m. -109.2°, d<sub>420</sub> 1.4653, n<sub>D20</sub> 1.3670. Cl<sub>2</sub>C:CHCF<sub>3</sub>, b. 55.1°, m. -87.2°, d<sub>420</sub> 1.4605, n<sub>D20</sub> 1.3690. ClCH<sub>2</sub>CH<sub>2</sub>CF<sub>3</sub> does not react with Mg or EtMgBr; with KOH it readily loses HCl but no HF. Cl<sub>2</sub>CHCH<sub>2</sub>CF<sub>3</sub> reacts readily with alc. alkali to give a quant. yield of ClCH:CHCF<sub>3</sub>. Cl<sub>3</sub>CCH<sub>2</sub>CF<sub>3</sub> loses HCl readily with an alkali; the Cl atoms appear easily replaceable with HgF<sub>2</sub> and preliminary expts. point to the ready formation of CF<sub>3</sub>CH<sub>2</sub>CF<sub>3</sub>.

IT 2730-43-0, Propene, 1-chloro-  
3,3,3-trifluoro-  
(preparation of)

RN 2730-43-0 HCAPLUS

CN 1-Propene, 1-chloro-3,3,3-trifluoro- (9CI) (CA INDEX NAME)



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L1	21	SEA FILE=REGISTRY	ABB=ON	PLU=ON	C3H2F4/MF
L2	3	SEA FILE=REGISTRY	ABB=ON	PLU=ON	L1 AND 1 (W) 3 (W) 3 (W) 3 (W) TETRAFLUORO?
L3	15	SEA FILE=REGISTRY	ABB=ON	PLU=ON	C3H2CLF3/MF
L4	3	SEA FILE=REGISTRY	ABB=ON	PLU=ON	L3 AND 3 (W) 3 (W) 3 (W) TRIFLUORO? AND 1 (W) CHLORO?
L5	15	SEA FILE=REGISTRY	ABB=ON	PLU=ON	C3HCLF4/MF
L6	3	SEA FILE=REGISTRY	ABB=ON	PLU=ON	L5 AND 1 (W) 3 (W) 3 (W) 3 (W) TETRAFLUORO? AND 1 (W) CHLORO?
L7	7	SEA FILE=REGISTRY	ABB=ON	PLU=ON	C3H3F5/MF
L8	1	SEA FILE=REGISTRY	ABB=ON	PLU=ON	L7 AND 1 (W) 1 (W) 1 (W) 3 (W) 3 (W) PENTAFLUORO?

NTAFLUORO?

L9 108 SEA FILE=HCAPLUS ABB=ON PLU=ON L2 OR (1(W)3(W)3(W)3(W)TETRAFLUORO? AND PROPEN?)

L10 SEL PLU=ON L2 1- CHEM : 9 TERMS

L11 64 SEA FILE=HCAPLUS ABB=ON PLU=ON L10

L12 113 SEA FILE=HCAPLUS ABB=ON PLU=ON L11 OR L9

L13 SEL PLU=ON L4 1- CHEM : 7 TERMS

L14 69 SEA FILE=HCAPLUS ABB=ON PLU=ON L13

L15 140 SEA FILE=HCAPLUS ABB=ON PLU=ON L14 OR (1(W)CHLORO?) (L) (3(W)3(W)3(W)TRIFLUORO?)

L16 SEL PLU=ON L6 1- CHEM : 4 TERMS

L17 12 SEA FILE=HCAPLUS ABB=ON PLU=ON L16

L18 29 SEA FILE=HCAPLUS ABB=ON PLU=ON L17 OR (1(W)CHLORO?) (L) (3(W)3(W)3(W)TETRAFLUORO?)

L19 SEL PLU=ON L8 1- CHEM : 9 TERMS

L20 652 SEA FILE=HCAPLUS ABB=ON PLU=ON L19

L21 831 SEA FILE=HCAPLUS ABB=ON PLU=ON L20 OR (1(W)1(W)1(W)3(W)3(W)PENTAFLUORO?)

L22 46 SEA FILE=HCAPLUS ABB=ON PLU=ON L12 AND (L15 OR L18 OR L21)

L23 39 SEA FILE=REGISTRY ABB=ON PLU=ON HYDROGEN FLUORIDE?/CN

L24 SEL PLU=ON L23 1- CHEM : 173 TERMS

L25 46497 SEA FILE=HCAPLUS ABB=ON PLU=ON L24

L26 46497 SEA FILE=HCAPLUS ABB=ON PLU=ON L25 OR HYDROGEN(W)FLUORIDE?

L27 21 SEA FILE=HCAPLUS ABB=ON PLU=ON L22 AND L26

L29 1341 SEA FILE=REGISTRY ABB=ON PLU=ON SODIUM HYDROXIDE?/CN OR POTASSIUM HYDROXIDE?/CN OR CALCIUM OXIDE?/CN OR CALCIUM DIHYDROXIDE?/CN OR CALCIUM HYDROXIDE?/CN OR CALCIUM OXIDE?

L30 1372 SEA FILE=REGISTRY ABB=ON PLU=ON L29 OR CAUSTIC

L31 740910 SEA FILE=HCAPLUS ABB=ON PLU=ON L30 OR (SODIUM OR POTASSIUM OR CALCIUM) (W)?HYDROXIDE? OR CALCIUM(W)OXIDE? OR KOH OR NAOH OR CAO OR CAO

L32 11 SEA FILE=HCAPLUS ABB=ON PLU=ON (L22 AND L31) NOT L27

L33 14 SEA FILE=HCAPLUS ABB=ON PLU=ON L22 NOT (L27 OR L32)

=&gt;

=&gt;

=&gt; d ibib abs hitstr l33 1-14

L33 ANSWER 1 OF 14 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2004:370877 HCAPLUS

DOCUMENT NUMBER: 140:377333

TITLE: Pentafluoropropene-based compositions

INVENTOR(S): Pham, Hang T.; Singh, Rajiv R.; Wilson, David P.

PATENT ASSIGNEE(S): Honeywell International Inc., USA

SOURCE: PCT Int. Appl., 31 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 4

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2004037752	A2	20040506	WO 2003-US33797	20031027
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ,			

OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM,  
 TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW  
 RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY,  
 KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES,  
 FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR,  
 BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

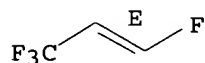
US 2004127383 A1 20040701 US 2003-694079 20031027  
 US 6858571 B2 20050222

PRIORITY APPLN. INFO.: US 2002-421263P P 20021025  
 US 2002-421435P P 20021025

AB Provided are azeotrope-like compns. comprising pentafluoropropene (HFO-1225) and a fluid selected from the group consisting of 3,3,3-trifluoropropene (HFO-1243zf), 1,1-difluoroethane (HFC-152a), **trans-1,3,3,3-tetrafluoropropene** (HFO-1234ze), and combinations of two or more thereof. Also provided are uses thereof including as refrigerants, blowing agents, sprayable compns., flame suppressant, and the like. More than one concentration range of HFO-1225 is effective, depending upon the cosolvent.

IT 29118-24-9, **trans-1,3,3,3-Tetrafluoropropene**  
 RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process)  
 (HFO-1234ze; azeotrope-like pentafluoropropene-based compns.)  
 RN 29118-24-9 HCAPLUS  
 CN 1-Propene, 1,3,3,3-tetrafluoro-, (1E)- (9CI) (CA INDEX NAME)

Double bond geometry as shown.



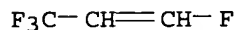
L33 ANSWER 2 OF 14 HCAPLUS COPYRIGHT 2005 ACS on STN  
 ACCESSION NUMBER: 2004:12861 HCAPLUS  
 DOCUMENT NUMBER: 140:76829  
 TITLE: Photochemical process of making fluorinated alcohols from the reaction of methanol with fluorinated alkenes  
 INVENTOR(S): Nair, Haridasan K.; Nalewajek, David; Poss, Andrew  
 PATENT ASSIGNEE(S): Honeywell International, Inc., USA  
 SOURCE: U.S., 8 pp.  
 CODEN: USXXAM  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 6673976	B1	20040106	US 2002-247383	20020919
WO 2004026799	A2	20040401	WO 2003-US29694	20030918
WO 2004026799	A3	20040930		

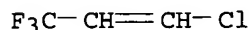
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZM, ZW  
 RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY,

KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES,  
 FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR,  
 BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

PRIORITY APPLN. INFO.: US 2002-247383 A 20020919  
 OTHER SOURCE(S): CASREACT 140:76829; MARPAT 140:76829  
 AB Methods for producing fluorinated alcs. (e.g., 2,2,4,4,4-pentafluorobutan-  
 1-ol) from non-perfluorinated fluoroolefins (e.g., 1,1,3,3,3-  
 pentafluoropropene) and methanol in the presence of a free-radical  
 initiator (e.g., di-tert-Bu peroxide) and UV irradiation  
 IT 1645-83-6, 1,3,3,3-  
**Tetrafluoropropene 2730-43-0, 1-Chloro**  
**-3,3,3-trifluoropropene**  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (photochem. process of making fluorinated alcs. from the reaction of  
 methanol with fluorinated alkenes)  
 RN 1645-83-6 HCAPLUS  
 CN 1-Propene, 1,3,3,3-tetrafluoro- (9CI) (CA INDEX NAME)



RN 2730-43-0 HCAPLUS  
 CN 1-Propene, 1-chloro-3,3,3-trifluoro- (9CI) (CA INDEX NAME)



REFERENCE COUNT: 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS  
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L33 ANSWER 3 OF 14 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2002:606347 HCAPLUS

DOCUMENT NUMBER: 137:154685

TITLE: Method for purification of 1,1,  
 1,3,3-  
**pentafluoropropane**

INVENTOR(S): Suzuki, Yasuhiro; Yanase, Koichi; Yokoyama, Takaaki

PATENT ASSIGNEE(S): Asahi Glass Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 4 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2002226411	A2	20020814	JP 2001-22291	20010130
PRIORITY APPLN. INFO.:			JP 2001-22291	20010130

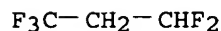
AB The title method comprises contacting 1,1,1,  
**3,3-pentafluoropropane** (I) [which contains 5  
 mass ppm to 2 mass % halopropenes] with a solid adsorbent (e.g., activated  
 carbon). The treatment of I with activated carbon greatly removed  
 fluororopropenes and chlorofluoropropenes.

IT 460-73-1P, 1,1,1,3,  
**3-Pentafluoropropane**

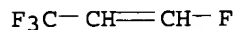
RL: PUR (Purification or recovery); PREP (Preparation)  
 (method for purification of 1,1,1,3,

**3-pentafluoropropane)**

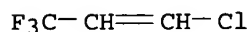
RN 460-73-1 HCAPLUS  
 CN Propane, 1,1,1,3,3-pentafluoro- (6CI, 8CI, 9CI) (CA INDEX NAME)



IT 1645-83-6, 1,3,3,3-  
**Tetrafluoro-1-propene** 2730-43-0,  
 1-Chloro-3,3,3-  
**Trifluoro-1-propene**  
 RL: REM (Removal or disposal); PROC (Process)  
 (method for purification of 1,1,1,3,  
**3-pentafluoropropane**)  
 RN 1645-83-6 HCAPLUS  
 CN 1-Propene, 1,3,3,3-tetrafluoro- (9CI) (CA INDEX NAME)



RN 2730-43-0 HCAPLUS  
 CN 1-Propene, 1-chloro-3,3,3-trifluoro- (9CI) (CA INDEX NAME)



L33 ANSWER 4 OF 14 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2002:268551 HCAPLUS

DOCUMENT NUMBER: 136:279103

TITLE: Preparation of 1,1,1,  
**3,3-pentafluoropropane**

INVENTOR(S): Kaneda, Shozo; Ishihara, Akira; Sakyu, Fuyuhiko;  
 Hibino, Yasuo

PATENT ASSIGNEE(S): Central Glass Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

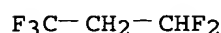
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2002105006	A2	20020410	JP 2000-298230	20000929
PRIORITY APPLN. INFO.:			JP 2000-298230	20000929

OTHER SOURCE(S): CASREACT 136:279103

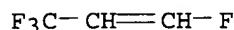
AB The compound (I) is prepared by fluorination of 1-chloro-  
**3,3,3-trifluoropropene** or 1  
**,3,3,3-tetrafluoropropene** with HF  
 in the presence of Cl<sub>2</sub>, wherein fluorination apparatus has a reactor (A) packed  
 with SbCl<sub>5</sub>/C with temperature ≥150° and a reactor (B) packed with  
 SbCl<sub>5</sub>/C with temperature 20-150° in series and reactor A and B are used  
 as the first reactor alternately and repeatedly. 1-  
**Chloro-3,3,3-**  
**trifluoropropene** was fluorinated with HF in the presence of Cl<sub>2</sub> and  
 SbCl<sub>5</sub>/C at 180° in the first reactor and 80° in the second



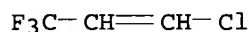
reactor to give 98.1% I.  
 IT 460-73-1P, 1,1,1,3,  
 3-Pentafluoropropane  
 RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP  
 (Preparation)  
 (preparation of pentafluoropropane)  
 RN 460-73-1 HCAPLUS  
 CN Propane, 1,1,1,3,3-pentafluoro- (6CI, 8CI, 9CI) (CA INDEX NAME)



IT 1645-83-6, 1,3,3,3-  
 Tetrafluoropropene 2730-43-0, 1-Chloro  
 -3,3,3-trifluoropropene  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (preparation of pentafluoropropane)  
 RN 1645-83-6 HCAPLUS  
 CN 1-Propene, 1,3,3,3-tetrafluoro- (9CI) (CA INDEX NAME)



RN 2730-43-0 HCAPLUS  
 CN 1-Propene, 1-chloro-3,3,3-trifluoro- (9CI) (CA INDEX NAME)



L33 ANSWER 5 OF 14 HCAPLUS COPYRIGHT 2005 ACS on STN  
 ACCESSION NUMBER: 2001:152616 HCAPLUS  
 DOCUMENT NUMBER: 134:193124  
 TITLE: Method for removing unsaturated impurities from  
 1,1,1,3,  
 3-pentafluoropropane by chlorination  
 INVENTOR(S): Okamoto, Hidekazu; Ohnishi, Keiichi  
 PATENT ASSIGNEE(S): Asahi Glass Company, Limited, Japan  
 SOURCE: PCT Int. Appl., 13 pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001014295	A1	20010301	WO 2000-JP5654	20000823
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				

JP 2001058967	A2	20010306	JP 1999-234980	19990823
EP 1125906	A1	20010822	EP 2000-954939	20000823
EP 1125906	B1	20040421		

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,  
IE, SI, LT, LV, FI, RO

US 6414203	B1	20020702	US 2001-830061	20010509
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PRIORITY APPLN. INFO.:			JP 1999-234980	A 19990823
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			WO 2000-JP5654	W 20000823
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AB Described is a method of treatment by which the content of unsatd.-compound impurities in 1,1,1,3,3-pentafluoropropane (R245fa) is reduced while minimizing the loss of R245fa. R245fa containing unsatd. compds. as impurities is brought into contact with chlorine gas in a gas phase in the presence of an activated carbon catalyst to convert the unsatd. compds. to chlorine adducts. This process efficiently reduces the content of the impurities such as 1-chloro-3,3,3-trifluoropropene (R1233zd), 1,3,3,3-tetrafluoropropene (R1234ze), 1,2-dichloro-3,3,3-trifluoropropene (R1223x), 1-chloro-1,3,3,3-tetrafluoropropene (R1224zb), 2-chloro-1,3,3,3-tetrafluoropropene (R1224xe), and 2-chloro-3,3,3-trifluoropropene (R1233xf) which are known to be present at a total of 300-20,000 ppm in 1,1,1,3,3-pentafluoropropane and are difficult to remove them by distillation. Thus, Cl(g) at 100 mL/min was passed through an Inconel U tube (54 cm diameter + 600 cm length) packed with activated charcoal catalyst (shirasagi C2X, Takeda Chemical Industries, Ltd., Japan) in a oil bath at 200° for 6 h, followed by feeding a mixture of R245fa 99.100, R1234ze 0.124, R1233zd 0.544% (based on gas chromatog. area), and R235fa (chlorinated R245fa, not detected) at 300 mL/min and Cl(g) at 3 mL/min to contact the catalyst at 150°. The product gas was passed through a water trap to remove the acid components to give a mixture of R245fa 99.580, R1234ze 0.001, R1233zd (not detected) and R235fa 0.076%, recovering 980 g R235fa (99.9% purity).

IT 460-73-1DP, R245Fa, chlorinated derivative  
RL: BYP (Byproduct); PREP (Preparation)  
(method for removing unsatd. impurities from pentafluoropropane by chlorination over activated charcoal)

RN 460-73-1 HCAPLUS

CN Propane, 1,1,1,3,3-pentafluoro- (6CI, 8CI, 9CI) (CA INDEX NAME)

F<sub>3</sub>C-CH<sub>2</sub>-CHF<sub>2</sub>

IT 460-73-1P, R245Fa  
RL: PUR (Purification or recovery); PREP (Preparation)  
(method for removing unsatd. impurities from pentafluoropropane by chlorination over activated charcoal)

RN 460-73-1 HCAPLUS

CN Propane, 1,1,1,3,3-pentafluoro- (6CI, 8CI, 9CI) (CA INDEX NAME)

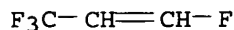
F<sub>3</sub>C-CH<sub>2</sub>-CHF<sub>2</sub>

IT 1645-83-6, 1,3,3,3-Tetrafluoropropene 2730-43-0, 1-Chloro

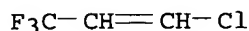
**-3,3,3-trifluoropropene**

RL: REM (Removal or disposal); PROC (Process)  
(method for removing unsatd. impurities from pentafluoropropane by  
chlorination over activated charcoal)

RN 1645-83-6 HCAPLUS  
CN 1-Propene, 1,3,3,3-tetrafluoro- (9CI) (CA INDEX NAME)



RN 2730-43-0 HCAPLUS  
CN 1-Propene, 1-chloro-3,3,3-trifluoro- (9CI) (CA INDEX NAME)



REFERENCE COUNT: 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L33 ANSWER 6 OF 14 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1999:733871 HCAPLUS

DOCUMENT NUMBER: 131:323042

TITLE: Multi-step process and catalyst for preparing  
1,1,1-trifluoropropene from 1,1,  
1,3,3-

**pentafluoropropane**

INVENTOR(S): Van der Puy, Michael

PATENT ASSIGNEE(S): AlliedSignal Inc., USA

SOURCE: U.S., 6 pp., Division of U.S. Ser. No. 794,984.

CODEN: USXXAM

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 5986151	A	19991116	US 1998-143133	19980828
PRIORITY APPLN. INFO.:			US 1997-794984	A3 19970205

AB 1,1,1-Trifluoropropene, useful as an intermediate and monomer (no data),  
is prepared in high yield and selectivity by dehydrofluorinating 1  
1,1,1,3,3-

**pentafluoropropane** in the presence of a Pd/C catalyst to produce  
1,1,1,3-tetrafluoropropene, hydrogenating the 1,1,1,3-tetrafluoropropene  
to produce 1,1,1,3-tetrafluoropropane, and then dehydrofluorinating the  
1,1,1,3-tetrafluoropropane to produce 1,1,1-trifluoropropene.

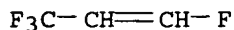
IT 1645-83-6P 29118-24-9P 29118-25-0P

RL: IMF (Industrial manufacture); RCT (Reactant); SPN (Synthetic  
preparation); PREP (Preparation); RACT (Reactant or reagent)

(multi-step process and catalyst for preparing 1,1,1-trifluoropropene from  
1,1,1,3,3-

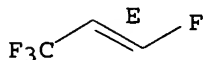
**pentafluoropropane)**

RN 1645-83-6 HCAPLUS  
CN 1-Propene, 1,3,3,3-tetrafluoro- (9CI) (CA INDEX NAME)



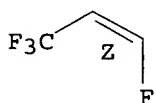
RN 29118-24-9 HCAPLUS  
 CN 1-Propene, 1,3,3,3-tetrafluoro-, (1E)- (9CI) (CA INDEX NAME)

Double bond geometry as shown.



RN 29118-25-0 HCAPLUS  
 CN 1-Propene, 1,3,3,3-tetrafluoro-, (1Z)- (9CI) (CA INDEX NAME)

Double bond geometry as shown.



IT 460-73-1, 1,1,1,3,  
 3-Pentafluoropropane  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (multi-step process and catalyst for preparing 1,1,1-trifluoropropene from  
 1,1,1,3,3-  
 pentafluoropropane)  
 RN 460-73-1 HCAPLUS  
 CN Propane, 1,1,1,3,3-pentafluoro- (6CI, 8CI, 9CI) (CA INDEX NAME)



REFERENCE COUNT: 16 THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS  
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L33 ANSWER 7 OF 14 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1999:331270 HCAPLUS

DOCUMENT NUMBER: 130:352023

TITLE: Continuous preparation of 1,3,  
 3,3-tetrafluoropropene

INVENTOR(S): Yoshikawa, Satoru; Kaneda, Shozo

PATENT ASSIGNEE(S): Central Glass Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 4 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO..	KIND	DATE	APPLICATION NO.	DATE
JP 11140002	A2	19990525	JP 1997-308541	19971111
PRIORITY APPLN. INFO.:			JP 1997-308541	19971111

AB 1,3,3,3-Tetrafluoropropane

is prepared by passing 1,1,1,3,

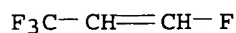
3-pentafluoropropane (I) through the reaction region

heated in a gas phase. The reaction region may be (metal compound-containing)

C. HF was fed into a reactor containing activated C (Shirasagi GX)-supported

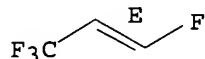
Cr(NO<sub>3</sub>)<sub>3</sub> at 380° and then gaseous I was fed into a reactor to give a product containing **trans-1,3,3,3-tetrafluoropropene** (trans-II) 70.8, cis-II 17.6, and I 8.3%.

IT 1645-83-6P, 1,3,3,3-  
**Tetrafluoropropene** 29118-24-9P, **trans-1,3,3,3-Tetrafluoropropene**  
 RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)  
 (continuous preparation of 1,3,3,3-  
**tetrafluoropropene** from 1,1,1,3,3-pentafluoropropane with activated C-supported Cr catalyst)  
 RN 1645-83-6 HCAPLUS  
 CN 1-Propene, 1,3,3,3-tetrafluoro- (9CI) (CA INDEX NAME)

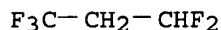


RN 29118-24-9 HCAPLUS  
 CN 1-Propene, 1,3,3,3-tetrafluoro-, (1E)- (9CI) (CA INDEX NAME)

Double bond geometry as shown.



IT 460-73-1, 1,1,1,3,3-Pentafluoropropane  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (continuous preparation of 1,3,3,3-  
**tetrafluoropropene** from 1,1,1,3,3-pentafluoropropane with activated C-supported Cr catalyst)  
 RN 460-73-1 HCAPLUS  
 CN Propane, 1,1,1,3,3-pentafluoro- (6CI, 8CI, 9CI) (CA INDEX NAME)



L33 ANSWER 8 OF 14 HCAPLUS COPYRIGHT 2005 ACS on STN  
 ACCESSION NUMBER: 1998:555741 HCAPLUS  
 DOCUMENT NUMBER: 129:204008  
 TITLE: Manufacture of rigid polyurethane foams with less decomposition of 1,1,1,3,3-pentafluoropropane  
 INVENTOR(S): Shibata, Noriaki; Tsuchiya, Tatsumi; Ite, Tetsu; Shibamura, Satoshi  
 PATENT ASSIGNEE(S): Daikin Industries, Ltd., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 10226718	A2	19980825	JP 1997-31843	19970217
PRIORITY APPLN. INFO.:			JP 1997-31843	19970217

AB Title foams are manufactured from polyols and organic polyisocyanates by using 1,1,1,3,3-pentafluoropropane (HFC 245fa) as blowing agent, stabilizers for HFC 245fa, and organic metal-based catalysts and/or imidazole-based catalysts. Thus, 100 parts o-tolylenediamine-based polyether-polyols (OH value 400 mgKOH/g) was reacted with 106 parts polymethylenepolyphenylene isocyanate 106 parts in the presence of SH 193, 1-butyl-2-methylimidazole, HFC 245fa, and nitrobenzene to give a foam with 1,1,1,3-tetrafluoropropylene content 30 ppm.

IT 460-73-1, HFC 245fa  
 RL: NUU (Other use, unclassified); USES (Uses)  
 (blowing agent; manufacture of rigid polyurethane foams with low content of decomposed compds. of HFC 245fa as blowing agents)

RN 460-73-1 HCAPLUS

CN Propane, 1,1,1,3,3-pentafluoro- (6CI, 8CI, 9CI) (CA INDEX NAME)

$$\text{F}_3\text{C}-\text{CH}_2-\text{CHF}_2$$

IT 1645-83-6  
 RL: FMU (Formation, unclassified); MOA (Modifier or additive use); FORM (Formation, nonpreparative); USES (Uses)  
 (manufacture of rigid polyurethane foams with low content of decomposed compds. of HFC 245fa as blowing agents)

RN 1645-83-6 HCAPLUS

CN 1-Propene, 1,3,3,3-tetrafluoro- (9CI) (CA INDEX NAME)

$$\text{F}_3\text{C}-\text{CH}=\text{CH}-\text{F}$$

L33 ANSWER 9 OF 14 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1998:341532 HCAPLUS

DOCUMENT NUMBER: 129:17243

TITLE: Liquid-phase catalytic fluorination of hydrochlorocarbon and hydrochlorofluorocarbon

INVENTOR(S): Thenappan, Alagappan; Tung, Hsueh S.; Bell, Robert L.

PATENT ASSIGNEE(S): Alliedsignal Inc., USA

SOURCE: PCT Int. Appl., 27 pp.  
 CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9821171	A1	19980522	WO 1997-US20448	19971112
W: AL, AU, BA, BB, BG, BR, CA, CN, CU, CZ, EE, GE, GH, HU, ID, IL, IS, JP, KP, KR, LK, LR, LS, LT, LV, MG, MK, MN, MW, MX, NZ, PL, RO, RU, SD, SG, SI, SK, SL, TR, TT, UA, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
RW: GH, KE, LS, MW, SD, SZ, UG, ZW, AT, BE, CH, DE, DK, ES, FI, FR,				

GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA,  
GN, ML, MR, NE, SN, TD, TG

US 6023004 A 20000208 US 1996-744157 19961112  
CA 2271341 AA 19980522 CA 1997-2271341 19971112  
AU 9854324 A1 19980603 AU 1998-54324 19971112  
EP 938461 A1 19990901 EP 1997-948216 19971112  
EP 938461 B1 20011017  
R: DE, ES, FR, GB, IT, NL  
JP 2001503771 T2 20010321 JP 1998-522719 19971112  
JP 3389251 B2 20030324  
EP 1104748 A2 20010606 EP 2001-103592 19971112  
EP 1104748 A3 20010613  
R: DE, ES, FR, GB, IT, NL  
ES 2167798 T3 20020516 ES 1997-948216 19971112  
KR 2000053190 A 20000825 KR 1999-704154 19990511  
US 6689924 B1 20040210 US 1999-467869 19991220

PRIORITY APPLN. INFO.:

US 1996-744157 A 19961112  
EP 1997-948216 A3 19971112  
WO 1997-US20448 W 19971112

AB The process is useful for fluorinating hydrochloropropanes, hydrochlorofluoropropanes, hydrochloropropenes and hydrochlorofluoropropenes and most particularly for fluorinating 1,1,1,3,3-pentachloropropane to 1,1,1,3,3-pentafluoropropane. Suitable catalysts include (i) a pentavalent molybdenum halide; (ii) a tetravalent tin or titanium halide; (iii) a mixture of a pentavalent antimony, molybdenum, tantalum or niobium halide with a tetravalent tin or titanium halide; and (iv) a mixture of a pentavalent antimony halide with a trivalent antimony halide. Products of this process are useful in a variety of applications including solvents, blowing agents, and refrigerants. Thus, CCl<sub>3</sub>CH<sub>2</sub>CHCl<sub>2</sub> was reacted with HF in the presence of SnCl<sub>4</sub> for 5 h at ≤135° to give CF<sub>3</sub>CH<sub>2</sub>CHF<sub>2</sub> 57, CF<sub>3</sub>CH<sub>2</sub>CHFCl 9, CF<sub>3</sub>CH:CHF 3, and CF<sub>3</sub>CH:CHCl 30%.

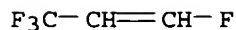
IT 460-73-1P, 1,1,1,3,3-Pentafluoropropane  
RL: IMF (Industrial manufacture); PREP (Preparation)  
(manufacture of; liquid-phase catalytic fluorination of hydrochlorocarbon and hydrochlorofluorocarbon)

RN 460-73-1 HCAPLUS  
CN Propane, 1,1,1,3,3-pentafluoro- (6CI, 8CI, 9CI) (CA INDEX NAME)

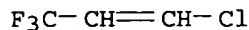
F<sub>3</sub>C-CH<sub>2</sub>-CHF<sub>2</sub>

IT 1645-83-6P, 1,3,3,3-Tetrafluoro-1-propene 2730-43-0P, 1-Chloro-3,3,3-trifluoro-1-propene  
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)  
(manufacture of; liquid-phase catalytic fluorination of hydrochlorocarbon and hydrochlorofluorocarbon)

RN 1645-83-6 HCAPLUS  
CN 1-Propene, 1,3,3,3-tetrafluoro- (9CI) (CA INDEX NAME)



RN 2730-43-0 HCAPLUS  
 CN 1-Propene, 1-chloro-3,3,3-trifluoro- (9CI) (CA INDEX NAME)



REFERENCE COUNT: 20 THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L33 ANSWER 10 OF 14 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1997:805703 HCAPLUS

DOCUMENT NUMBER: 128:34512

TITLE: Process for preparing 1,1,  
1,3,3-

**pentafluoropropane** by fluorination

INVENTOR(S): Nakada, Tatsuo; Shibamura, Takashi; Yamamoto, Akinori

PATENT ASSIGNEE(S): Daikin Industries Ltd., Japan

SOURCE: PCT Int. Appl., 21 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9745388	A1	19971204	WO 1997-JP956	19970321
W: CN, KR, US				
RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
JP 09323946	A2	19971216	JP 1996-160776	19960531
JP 3518169	B2	20040412		
EP 919528	A1	19990602	EP 1997-907431	19970321
EP 919528	B1	20021113		
R: BE, DE, ES, FR, GB, IT, NL				
ES 2186872	T3	20030516	ES 1997-907431	19970321
KR 2000016199	A	20000325	KR 1998-709767	19981130
US 6316682	B1	20011113	US 1998-194609	19981130
PRIORITY APPLN. INFO.:			JP 1996-160776	A 19960531
			WO 1997-JP956	W 19970321

OTHER SOURCE(S): MARPAT 128:34512

AB Characterized is a process for preparing 1,1,1,  
3,3-pentafluoropropane (I) by reacting at  
least one member selected among chlorofluoropropanes and chloropropanes  
represented by CX<sub>3</sub>CH<sub>2</sub>CHX<sub>2</sub> (X = F, Cl, that not all the X represent F) with  
antimony chloride fluoride. I, which substitutes for CFC and HCFC and is  
industrially important as a foaming agent, a refrigerant, a detergent and  
a propellant, is economically prepared in a high yield.

IT 1645-83-6P 2730-43-0P

RL: BYP (Byproduct); PREP (Preparation)

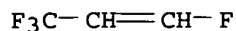
(process for preparing 1,1,1,3,

3-pentafluoropropane by fluorination)

RN 1645-83-6 HCAPLUS

CN 1-Propene, 1,3,3,3-tetrafluoro- (9CI) (CA INDEX NAME)





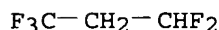
RN 2730-43-0 HCAPLUS

CN 1-Propene, 1-chloro-3,3,3-trifluoro- (9CI) (CA INDEX NAME)

IT 460-73-1P, 1,1,1,3,  
3-PentafluoropropaneRL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP  
(Preparation)(process for preparing 1,1,1,3,  
3-pentafluoropropane by fluorination)

RN 460-73-1 HCAPLUS

CN Propane, 1,1,1,3,3-pentafluoro- (6CI, 8CI, 9CI) (CA INDEX NAME)



L33 ANSWER 11 OF 14 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1996:738194 HCAPLUS

DOCUMENT NUMBER: 126:7676

TITLE: Method of inhibiting decomposition of  
1,1,1,2,3,3-hexafluoropropane and 1,  
1,1,3,3-  
pentafluoropropane and decomposition inhibitor

INVENTOR(S): Tsuchiya, Tatsumi; Ide, Satoshi

PATENT ASSIGNEE(S): Daikin Industries, Ltd., Japan

SOURCE: PCT Int. Appl., 34 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9633153	A1	19961024	WO 1996-JP952	19960404
W: US				
RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
JP 08291089	A2	19961105	JP 1995-93468	19950419
EP 822171	A1	19980204	EP 1996-908366	19960404
EP 822171	B1	20000816		
R: BE, DE, ES, FR, GB, IT, NL				
ES 2150111	T3	20001116	ES 1996-908366	19960404
US 5959165	A	19990928	US 1997-945126	19971017
PRIORITY APPLN. INFO.:			JP 1995-93468	A 19950419
			WO 1996-JP952	W 19960404

AB 1,1,1,2,3,3-Hexafluoropropane (HFC236ea) or 1,1,  
1,3,3-pentafluoropropane (HFC245fa)  
is mixed with (1) at least one nitro compound and (2) at least one member  
selected among aromatic hydrocarbons and alicyclic unsatd. hydrocarbons, and  
further with (3) at least one member selected among aliphatic unsatd.  
hydrocarbons, epoxy compds., ether compds., phenol compound, ester compds.  
and cyclic nitrogen compds. The stabilities of HFC236ea can be remarkably

improved during storage thereof, use thereof, and use of product containing the same. This method for inhibiting decomposition of HFC236ea and HFC245fa is particular useful, when HFC236ea and HFC245fa are used as foaming agents for insulating foams such as polyurethane foams. Thus, 71 weight part polyphenylpolymethylene polyisocyanate was added to a mixture of o-tolylenediamine polyether polyol 100, silicone foaming regulator (SH-193, Tore Silicon, Japan) 1.5, tetramethylhexamethylenediamine (catalyst) 3.4, HFC236ea (foaming agent) 39, PhNO<sub>2</sub> (decomposition inhibitor) 0.5, and  $\alpha$ -methylstyrene (decomposition inhibitor) 0.5 weight part, hand-mixed, and aged for 1 day to give a polyurethane foam. This foam was cut into a 10-cm cube, packed in a aluminum-laminated pack, crushed by a press, and the decomposition gas formed in exothermic reaction during urethane foaming, was determined to be 70 and 20 ppm for CF<sub>3</sub>CH:CF<sub>2</sub> and CF<sub>3</sub>CFHCFH<sub>2</sub>, resp., vs. 1,000 and 250 ppm, resp. for the polyurethane foam prepared without using the decomposition inhibitors.

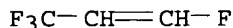
IT 1645-83-6, 1,3,3,3-

**Tetrafluoropropylene**

RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)  
(method for inhibiting decomposition of hexafluoropropane and pentafluoropropane foaming agents in synthesis of polyurethanes and decomposition inhibitors)

RN 1645-83-6 HCAPLUS

CN 1-Propene, 1,3,3,3-tetrafluoro- (9CI) (CA INDEX NAME)



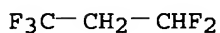
IT 460-73-1, 1,1,1,3,

**3-Pentafluoropropane**

RL: RCT (Reactant); TEM (Technical or engineered material use); RACT  
(Reactant or reagent); USES (Uses)  
(method for inhibiting decomposition of hexafluoropropane and pentafluoropropane foaming agents in synthesis of polyurethanes and decomposition inhibitors)

RN 460-73-1 HCAPLUS

CN Propane, 1,1,1,3,3-pentafluoro- (6CI, 8CI, 9CI) (CA INDEX NAME)



L33 ANSWER 12 OF 14 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1987:636016 HCAPLUS

DOCUMENT NUMBER: 107:236016

TITLE: Synthesis of perfluoroallyl chloride and some chlorofluoropropenes

AUTHOR(S): Paleta, Oldrich; Kvicala, Jaroslav; Gunter, Jaroslav; Dedek, Vaclav

CORPORATE SOURCE: Dep. Org. Chem., Prague Inst. Chem. Technol., Prague, 16628/6, Czech.

SOURCE: Bulletin de la Societe Chimique de France (1986), (6), 920-4

CODEN: BSCFAS; ISSN: 0037-8968

DOCUMENT TYPE: Journal

LANGUAGE: English

OTHER SOURCE(S): CASREACT 107:236016

AB Mixts. of pentachlorotrifluoro- or tetrachlorotetrafluoropropane isomers were chlorinated, fluorinated with SbF<sub>3</sub>Cl<sub>2</sub>, dehalogenated with Zn, and/or

photochem. reduced with Me<sub>2</sub>CHOH to give 7 individual chlorofluoropropanes and 6 **propenes**. During the reactions, the isomeric purity increased. ClCF<sub>2</sub>CF:CF<sub>2</sub> was prepared in 95% isomeric purity.

L33 ANSWER 13 OF 14 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1962:58309 HCAPLUS

DOCUMENT NUMBER: 56:58309

ORIGINAL REFERENCE NO.: 56:11098g-h

TITLE: The nuclear magnetic resonance spectra of fluorocarbons. III. Halogenated propynes, **propenes**, butenes, and cyclopentenes

AUTHOR(S): Beisner, Henry M.; Brown, Carlton L.; Williams, Dudley

CORPORATE SOURCE: Ohio State Univ., Columbus

SOURCE: Journal of Molecular Spectroscopy (1961), 7, 385-92

CODEN: JMOSA3; ISSN: 0022-2852

DOCUMENT TYPE: Journal

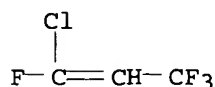
LANGUAGE: Unavailable

AB cf. CA 56, 8198h. The investigation of the nuclear magnetic resonances (NMR) of H<sub>1</sub> and F<sub>19</sub> in fluorocarbons is continued (loc. cit.) with the study of the NMR spectra of CF<sub>3</sub>C.tplbond.CH, Cl<sub>2</sub>C:CHCF<sub>3</sub>, ClFC:CHCF<sub>3</sub>, CF<sub>3</sub>C(Cl):CClCF<sub>3</sub>, CF<sub>3</sub>C(Cl):CFCF<sub>3</sub>, 1,2dichloroperfluorocyclopentene, and perfluorocyclopentene. Interpretation was complicated in some respects by the lack of free rotation about multiple bonds. Chemical shifts at various intermol. sites and spin-spin coupling consts. are determined and tabulated. Mol. parameters are given and spectra are illustrated.

IT 460-71-9, **Propene, 1-chloro-1,3,3,3-tetrafluoro-**  
(nuclear magnetic resonance of)

RN 460-71-9 HCAPLUS

CN 1-Propene, 1-chloro-1,3,3,3-tetrafluoro- (9CI) (CA INDEX NAME)



L33 ANSWER 14 OF 14 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 1959:6354 HCAPLUS

DOCUMENT NUMBER: 53:6354

ORIGINAL REFERENCE NO.: 53:1102b-c

TITLE: Catalytic hydrogenation of  $\phi$ -olefins

AUTHOR(S): Knunyants, I. L.; Mysov, E. I.; Krasuskaya, M. P.

CORPORATE SOURCE: Inst. Heteroorg. Compds., Moscow

SOURCE: Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya (1958) 906-7

CODEN: IASKA6; ISSN: 0002-3353

DOCUMENT TYPE: Journal

LANGUAGE: Unavailable

AB The following % yields of hydrogenation products were obtained from the indicated olefins with catalysts shown: CF<sub>2</sub>:CF<sub>2</sub>, Pd, 20°, 96% CF<sub>2</sub>HCF<sub>2</sub>H; CF<sub>2</sub>:CF<sub>2</sub>, Ni, 90-100°, 66% CF<sub>2</sub>HCF<sub>2</sub>H and 14% CF<sub>2</sub>HCFH<sub>2</sub>; CF<sub>3</sub>CF:CF<sub>2</sub>, Pd, 20°, 96% CF<sub>3</sub>CHFCF<sub>2</sub>H; (CF<sub>3</sub>)C:CF<sub>2</sub>, Pd, 20°, 95% (CF<sub>3</sub>)<sub>2</sub>CHCF<sub>2</sub>H; Ni, 100°, 10% (CF<sub>3</sub>)<sub>2</sub>CHCF<sub>2</sub>H and 75% (CF<sub>3</sub>)<sub>2</sub>CHMe; CF<sub>2</sub>:CFC<sub>2</sub>, Pd, 20°, 60% CF<sub>2</sub>:CFH and 25% CF<sub>2</sub>HCFH<sub>2</sub>; CF<sub>3</sub>CF:CFH, Pd, 20°, 65% CF<sub>3</sub>CFHCFH<sub>2</sub>; (CF<sub>3</sub>)<sub>2</sub>C:CFH, Pd, 20°, 85% (CF<sub>3</sub>)<sub>2</sub>CHCFH<sub>2</sub>; (CF<sub>3</sub>)<sub>2</sub>C:CH<sub>2</sub>, Pd, 20°, 85% (CF<sub>3</sub>)<sub>2</sub>CHMe. The products lose HF readily yielding the corresponding fluoroolefins. CF<sub>3</sub>CF:CHF b. -20°; (CF<sub>3</sub>)<sub>2</sub>C:CHF b. 17°; (CF<sub>3</sub>)<sub>2</sub>C:CH<sub>2</sub> b. 13°.

Nyalley 10\_1626997

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